Evaluation of Investment Opportunities

Tools for Decisionmaking in Farming and Other Businesses

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PREFACE

Business managers, including farmers, constantly face alternative uses of their resources. In evaluating these uses, they must be concerned with the various costs and returns involved. These costs and returns frequently occur at different times. A dollar to be received in the future will not have the same value as a dollar today. The decisionmaker must compare these costs and returns even though they have different values. This report discusses mathematical procedures for comparing incomes and costs occurring at different times.

One cannot avoid making certain calculations if a sound evaluation is to be made. However, final decisions will not be based entirely on the results of the calculations. Other factors are also important such as age of the operator, a father-son agreement, nearness to an urban center, alternative employment or investment opportunities, or personal desires of the individual or his family. Such factors sometimes have greater weight than results determined by the mathematical formulas. But, sound evaluation of alternative investment opportunities includes relevant mathematical procedures.

Business managers have access to computer facilities. For example, the Virginia Extension Division maintains the Computerized Management Network facilities which are available nationally. These facilities, as well as many others, include programs that can be readily used to help the manager analyze investment opportunities or alternatives. However, this handbook is valuable when computer facilities are not available.

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CONTENTS

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INTRODUCTION

A manager constantly faces choices among ways to use his capital. Should he invest his limited capital in enlarging his inventory or invest it in more land improvements? Here, he can visualize the possibility of greater percentage returns in the shortrun if he uses his capital for more stock. Or, should he incur the costs of planting trees and fencing an area? Here, he realizes there will be no return for 10 or 20 or more years. The return could even go to others. Or, should he buy additional fertilizer? Here, he can usually visualize increased production the first year and possibly some increase over the next several crop years. Or, he might face the question of when he should sell: today at a given price or 10 years hence for some unknown price?

In such problems as well as many others, present values and estimated future values are involved. This handbook presents this complex subject of analysis of present and future values in such a manner as to make it useful for normal business operations.

Relatively simple problems are discussed in this report. A thorough understanding of the formulas used to solve these problems is important since they also apply to some of the more complex problems with which business managers might be concerned.

TERMS USED

Certain words in this report have meanings different from normal usage. For example, amount is normally used without reference to time. But, in this report, amount is always related to a future time. The following are main terms as used in this handbook of finance mathematics.

Amount is the sum that a payment or series of payments will be worth at some future time. It is a future value. This is represented by the symbol A in the equations.

Annual return is a payment received annually over a given period of time.

Annuity is a series of fixed, periodic payments. Also see FVUS and PVUS. In this report, only annuities for a given period are considered. It is possible, however, to have annuities whose terms depend upon the life of an individual.

Capitalization is the process for determining the present value of a series of payments to be received indefinitely.

Conversion period is the period of time for which interest or discount is calculated. When the rate is stated at a given annual rate, the conversion period is 1 year. If it is stated at a given semiannual rate, then the conversion period is 6 months, and the actual rate for the conversion period is half the stated rate.

Deferred annuity is an annuity starting at some future time. For example, you might buy an insurance policy that guarantees a certain monthly income when you become 65. This is a deferred annuity. Present value of a deferred annuity can be calculated by determining the value of the annuity at the time it starts and discounting the value to the present.

Discounting is the mathematical procedure used to determine the present value of amounts that will occur at some future time.

Future value is the same as the amount. This is represented by the symbol A in the equations.

FVUS stands for Future Value Uniform Series. This is the future value of a series of fixed, periodic payments.

j_p is the symbol for part of the correction factor used when the payment period differs from the conversion period. The complete correction factor is $\frac{i}{j_p}$ and the value of this complete factor is shown in Appendix 5 for selected values of i and p.

Original cost is the expenditure required to acquire the investment item. If installation costs, for example, are involved, these costs should be considered as a part of the original costs. If investment credit can be claimed, the original costs can be reduced by this amount or investment credit can be considered as future income.

Payment is a sum that can be paid out or received. This is represented by the symbol R in the equations.

Payment period denotes the frequency of payments. In the calculations, you need to determine the number of payments per conversion period.

Period is a conversion period or payment period. See definitions for conversion period and payment period.

Present value is a statement of what some future payment or payments are worth at the present time. This is represented by the symbol P in the equations.

PVUS stands for Present Value Uniform Series. This is the present value of a series of fixed, periodic payments.

Salvage value is the value that remains in the asset at the end of its useful life to you. It is your estimate of the price you can sell it for, either as used equipment or as junk.

FUTURE VALUE OF A PRESENT SUM

The future value or amount of a present value can be determined by using the following formula:

$$A = P \quad (1+i)^n \tag{1.1}$$

where: A = amount or future value
P = present value or principal
i = interest rate per conversion period
n = number of conversion periods

Assume that you have $10,000 today and that this will be invested at 6 percent interest for 10 years with the interest accumulating over the period. What will be the amount or value of this $10,000 in another 10 years? Using the formula, we solve for A where P is $10,000, i is 6 percent per annum, and n is 10 years. With the proper substitutions, the formula becomes:1/

$$A = \$10{,}000 \times \left[(1.06)^{10}\right] \tag{1.2}$$

The factor $(1.06)^{10}$ can be calculated, but the value of this factor can be taken from Appendix table 1. This table shows the compound amount of 1 for various values of i and n. The value of $(1.06)^{10}$ is 1.7908 (from App. 1, part 5). With this substitution, the formula becomes:

$$A = \$10{,}000 \times \left[1.7908\right] \tag{1.3}$$
$$= \$17{,}908$$

Thus, if $10,000 is invested today at 6 percent for 10 years, it will be worth, with accumulated interest, $17,908 at the end of that period. The

1/The square bracket as used in this publication indicates that the factor can be found in an appendix table or that the value has come from an appendix table.

formula used in the illustration is the standard compound interest formula. The amount of $10,000 at the end of each year is shown in table 1. The gain in interest over the previous year is the result of compounding. For example, during the first year, $600 is earned as interest. During the second year, interest is also earned on this $600, resulting in an additional $36 credit for interest in that year.

> Problem: You have some money not needed in your business. You are offered 8 percent interest per year for loan of $3,500, with principal and interest to be paid in 2 years. If you accept this offer, what will you receive in 2 years?

$$A = \$3,500 \times [(1.08)^2]$$
$$= \$3,500 \times [1.1664]$$
$$= \$4,082$$

You would receive $4,082 in 2 years.

Table 1--The interest process: Principal of $10,000 at 6 percent interest for 10 years

Year	Principal at beginning of Year	Interest earned during year[1/]	Gain in interest over previous year
		Dollars	
1	10,000	600	--
2	10,600	636	36
3	11,236	674	38
4	11,910	715	41
5	12,625	758	43
6	13,383	803	45
7	14,186	851	48
8	15,037	902	51
9	15,939	956	54
10	16,895	1,014	58
11	[2/]17,909	--	--

[1/]Interest is derived by multiplying the principal at beginning of the year by .06.

[2/]This is the same as the amount accumulated at the end of the 10th year. The dollar difference is due to rounding.

PRESENT VALUE OF A FUTURE AMOUNT

The following formula will help you find the present value of a sum that you will receive at some time in the future:

(2.1) $$P = \frac{A}{(1+i)^n}$$

where: P = present value
A = amount or future value
i = discount rate per conversion period
n = number of conversion periods

Let us assume that 10 years from now you will receive $10,000. What is the $10,000 worth to you today? The answer to this question depends on your preference to having $10,000 in 10 years or a lesser amount today. The amount must be discounted and the rate that is used will reflect your preference. A high rate means that you prefer to have fewer dollars today than the $10,000 in 10 years. A low rate means that it makes little difference to you whether you have the money today or 10 years from now.

Let us assume that your discount rate is 6 percent. Substituting these values in the formula, then P is to be determined with A equal to $10,000, i is 6 percent, and n is 10 years. Or:

(2.2) $$P = \frac{\$10,000}{\left[(1.06)^{10}\right]}$$

The factor $(1.06)^{10}$ can be taken from Appendix 1, part 5.

Often, however, it will be easier to solve the equation if a different table is used: one that shows the present value of 1 for various values of i and n. This table, known as the discount or the $(1+i)^{-n}$ table, is found in Appendix 2. The mathematical relationship between $(1+i)^n$ and $(1+i)^{-n}$ is:

(3.1) $$\frac{1}{(1+i)^n} = (1+i)^{-n}$$

This means that if you use the factor $(1+i)^n$ then you must divide the value of this factor into the amount. However, if you use the factor $(1+i)^{-n}$, then you can multiply the value of this factor by the amount. Formula 2.1 can be restated to read:

(4.1) $$P = A\ (1+i)^{-n}$$

In many problems, formula 4.1 will be far easier to use. To solve formula 2.1 or 4.1, we have the following substitution:

(4.2) $$P = \frac{\$10,000}{\left[1.7908\right]} = \$5,584 \qquad \text{or} \qquad P = \$10,000 \times \left[0.5584\right] = \$5,584$$

What does this $5,584 represent? It can be expressed in two ways.

1. You are saying that you would just as soon have $5,584 now as to have $10,000 in 10 years, because your discount rate is 6 percent.

2. Or, you are saying that if you take $5,584 today and invest it at 6 percent compound interest, then in 10 years it will accumulate to $10,000.

Table 2 shows the present value of $10,000 payable in 10 years and the value at the beginning of each year with the amounts that are discounted.

Table 2--The discounting process: Present value, for any given year, of $10,000 payable in 10 years at 6 percent discount per annum

Year	Value at end of year	Discount for given year[1]	Reduction in discount over previous year
		Dollars	
0	[2]5,585	- -	--
1	5,920	335	20
2	6,275	355	21
3	6,651	376	23
4	7,050	399	24
5	7,473	423	25
6	7,921	448	27
7	8,396	475	29
8	8,900	504	30
9	9,434	534	32
10	10,000	566	--

[1]The value at the end of any year is the value at the end of the previous year divided by 1.06 (formula 2.1).

[2]This is the same as the present value at the beginning of the 1st year.

Problem: You are offered $1,000 for timber in your woodlot. You estimate that the same timber could be sold for $1,500 in another 10 years. With a discount rate of 7.5 percent, should you sell now or wait 10 years? You must determine the present value of $1,500.

$$P = \$1,500 \left[(1.075)^{-10}\right]$$
$$= \$1,500 \times \left[.4852\right]$$
$$= \$728$$

The $1,500 you would get by waiting 10 years is worth only $728 today. You would be far better off to sell the timber today for $1,000.[2]

[2]You would need $2,061 in another 10 years to justify holding the timber, using formula 1.1.

INTEREST VS. DISCOUNT

At this point, you should be able to distinguish between the interest and discount process. In the first problem (using formula 1.1), we started with a given sum today. We went from the present to the future and determined the value of that sum for some future time. That involved the interest process.[3] In the second problem (using formula 4.1 in the discount process), the movement was reversed. We started with a given amount at some time in the future and determined the value of that at the present time.[4] With discounting, you end up with fewer dollars; with interest, you end up with more.

Frequently, when money is borrowed, a modified form of discounting is used to determine the cost to the borrower and the amount that is received. Whenever interest is paid in advance, the amount borrowed has been discounted. For example, if you receive $940 but agree to pay $1,000 back at the end of 1 year, the $1,000 has been discounted at 6 percent. The actual interest that you have paid on the amount that you received, $940, is 6.4 percent.[5] You would have been charged 6 percent interest if you had received $1,000 and paid back $1,060 at the end of the year.

PRESENT VALUE OF AN ANNUAL RETURN

If you are to receive $2,500 at the end of each year and the payments are to continue forever, you can determine the present value of this return by the use of the capitalization formula:

$$P = \frac{R}{i} \tag{5.1}$$

where: P = present value
R = annual payment
i = interest rate

In this problem, we want to determine P where R is equal to $2,500 and i, let us say, is 8 percent. With these substitutions, the formula becomes:

$$P = \frac{\$2,500}{0.08} \tag{5.2}$$
$$= \$31,250$$

The $31,250 can be described in two ways:

1. It is the present value of an annual income of $2,500 that will be received forever.

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[3] Actually, whenever you move from an earlier time to some future time, the interest process is involved.

[4] This can be from any future time to an earlier time.

[5] However, if the loan was repaid by equal monthly payments, the interest rate on the amount actually received would be almost 12%.

2. It is the amount that must be invested at 8 percent interest to obtain an annual return of $2,500 forever.

This problem has involved the use of the standard capitalization formula.

Problem: From your records, you estimate that you receive $34.55 per acre as average annual net return to land that is in continuous corn. What is the capitalized value of the land with an 11-percent rate?

$$P = \frac{\$34.55}{0.11}$$

$$= \$314$$

The land in continuous corn is worth $314 per acre.

PRESENT VALUE OF AN ANNUITY FOR A GIVEN TIME

Let us assume that you will receive $1,000 annually at the end of each year for the next 10 years. Your discount rate is 9 percent. You want to determine how much this annual income that you will receive over the next 10 years is worth to you today. The equation to solve this problem is:

(6.1) $$P = R \left(\frac{1-(1+i)^{-n}}{i} \right)$$

where: P = present value
R = payment per conversion period
i = discount rate per conversion period
n = number of conversion periods

The factor $\left[\frac{1-(1+i)^{-n}}{i} \right]$ can be obtained directly from the PVUS tables (App. table 3) for various values of i and for various number of conversion periods. In this case, we solve for P where R equals $1,000, n is 10 years, and i is 9 percent. In the PVUS table (App. table 3, part 6), we find that when i is 9 percent and n is 10, the factor is 6.4177. With the proper substitution, we solve:

(6.2) $$P = \$1,000 \times \left[6.4177 \right]$$

$$= \$6,417.70$$

What does this figure $6,417.70 mean? It can be interpreted in three ways:

1. It is the present value of 10 annual payments of $1,000 each, with payments made at the end of each year and with a 9-percent discount.

2. It is equal today to receiving $1,000 at the end of each year for the next 10 years, if your discount rate is 9 percent.

3. It also represents the principal which, if invested at 9 percent compound interest, will be completely exhausted, along with the interest, if $1,000 is taken from it at the end of each year.

Table 3 shows the way this can be derived, year by year.

Table 3--Present value of an annuity of $1,000 annually for 10 years at 9 percent interest, with year-by-year calculations

Year[1]	Amount to be received	Factor[2]	Present value for given R[3]	Present value cumulative
	Dollars		Dollars	
n	R	$(1+i)^{-n}$	$R(1+i)^{-n}$	$\sum_{n=1}^{n} R(1+i)^{-n}$
1	1,000	$(1.09)^{-1}$	917	917
2	1,000	$(1.09)^{-2}$	842	1,759
3	1,000	$(1.09)^{-3}$	772	2,531
4	1,000	$(1.09)^{-4}$	708	3,239
5	1,000	$(1.09)^{-5}$	650	3,889
6	1,000	$(1.09)^{-6}$	596	4,485
7	1,000	$(1.09)^{-7}$	547	5,032
8	1,000	$(1.09)^{-8}$	502	5,534
9	1,000	$(1.09)^{-9}$	460	5,994
10	1,000	$(1.09)^{-10}$	422	[4]6,416

[1]As of the end of the year.

[2]See Appendix table 2, part 5, for these factors.

[3]This is calculated by multiplying R times the factor taken from the appendix table.

[4]The difference between this and the answer obtained by using formula 6.1 is due to rounding.

There is a similarity between the individual calculations for each year and the discounting formula 4.1. Actually, the annuity formula is a summation formula for a series of discounts. The same answer can be obtained by discounting each annual payment and by totaling these items. This is the procedure used in table 3. Although this longer method can be used, it is far simpler to use the summation formula 6.1. This merely involves obtaining the annuity factor from the PVUS tables and multiplying this by the periodical payment.

> Problem: Someone wants to sell you a note that still has four more payments. It pays $750 per year with the first payment a year from now. You can buy the note for $2,788. Is it a bargain? You know that you would have no problem in getting 7.5 percent on an alternative investment. What investment would you have to make with 7.5 percent interest to obtain an annuity of $750 per year for 4 years?

Referring to the PVUS tables (App. table 3, part 6), we find that the factor for 7.5 percent for 4 years is 3.3493. Utilizing this factor in formula 6.1 we have:

$$P = \$750 \times \left[3.3493\right]$$
$$= \$2,511.98$$

An annuity of $750 per year for 4 years requires an investment of only $2,512 at 7.5 percent. The note for $2,788 would not be a bargain because the alternative investment would cost $276 less. If you had bought it at the asking price, you would have received only a 3-percent return instead of 7.5 percent.

FUTURE VALUE OF AN ANNUITY FOR A GIVEN TIME

You may, at times, be interested in the future value of an annuity. This value is usually referred to as the amount of an annuity. It can be determined by using the following formula:

(7.1) $$A = R\left(\frac{(1+i)^n-1}{i}\right)$$

where: A = amount or future value
R = payment per conversion period
i = interest rate per conversion period
n = number of conversion periods

For various values of i and n, we can find the value of the factor $\left[\frac{(1+i)^n-1}{i}\right]$ in the FVUS tables (App. table 4). We will use the same example as in the previous section: the annuity is $1,000, n is 10 years, and i is 9 percent. In the FVUS table, we find that when i is 9 percent and n is 10, the factor is 15.1929. Using formula 7.1, we have:

(7.2) $$A = \$1,000 \times \left[15.1929\right]$$
$$= \$15,192.90$$

This figure, $15,193, can be described as follows:

1. If we invest $1,000 at the end of each year for 10 years at 9 percent interest, the payments will accumulate, with interest, to $15,193 at the end of 10 years.

2. The value of $1,000 per year for 10 years at 9 percent interest is equal to $15,193 at the end of 10 years.

Table 4 shows the way this is derived.

Table 4--Amount of an annuity of $1,000 annually for 10 years at 6 percent interest, with year-by-year calculations

Year[1]	Periodic investment	Factor[2]	Value at end of 10 years[3]	Cumulative value from end of 10 years
	Dollars		- - - Dollars - - -	
n	R	$(1+i)^{10-n}$	$R(1+i)^{10-n}$	$\sum_{n=1}^{n} R(1+i)^{10-n}$
1	1,000	$(1.09)^9$	2,172	[4]15,194
2	1,000	$(1.09)^8$	1,993	13,022
3	1,000	$(1.09)^7$	1,828	11,029
4	1,000	$(1.09)^6$	1,677	9,201
5	1,000	$(1.09)^5$	1,539	7,524
6	1,000	$(1.09)^4$	1,412	5,985
7	1,000	$(1.09)^3$	1,295	4,573
8	1,000	$(1.09)^2$	1,188	3,278
9	1,000	$(1.09)^1$	1,090	2,090
10	1,000	$(1.09)^0$	1,000	1,000

[1]The investment is assumed to be made at the end of the year. Therefore, the first $1,000 investment earns interest for 9 years while the last $1,000 does not earn any interest. If an investment was made at the beginning of each year, the amount at the end of the 10th year would be $16,561.

[2]See Appendix table 1, part 5, for these factors.

[3]This is calculated by multiplying R times the factor taken from the appendix table.

[4]The $1 difference between this and the answer obtained by using formula 7.1 is due to rounding.

The interest formula 1.1 and the individual calculations for each year as shown in table 4 are similar. In table 4, the standard compound interest formula is used to calculate the amount of each periodic investment at the end of the 10-year period. For example, the amount of the third investment is equal to $1,000 $(1.09)^7$, or $1,828, at the end of the period. Individual calculations can be made for each year. The sum of these individual calculations amounts to $15,194. This is the same as that derived by using the regular annuity formula 7.1 except for the dollar difference that is due to rounding the figures in the process. One would normally use formula 7.1, which merely involves obtaining the annuity factor from the FVUS tables and a single multiplication.

Problem: You have an opportunity to buy into a small business enterprise. You will be required to pay $3,333 per year for the next 6 years. If you accept the rate of 9.5 percent, how much will you have tied up in this investment at the end of 6 years?

$$A = \$3{,}333 \times \left[\frac{1.095^6 - 1}{0.095}\right]$$

The annuity factor when i is 9.5 percent and n is 6 is found in Appendix table 4, part 6, and is 7.6189. We then have:

$$A = \$3,333 \times \boxed{7.6189}$$
$$= \$25,394$$

At the end of 6 years, you would have a total of $25,394 invested in the business.

BASIC FORMULAS

The five basic formulas we have discussed are:

(5.1)	$P = \frac{R}{i}$	The capitalization formula Present value	No table needed
(1.1)	$A = P\ (1+i)^n$	Compound interest formula Future value	Use compound interest tables (App. table 1)
(2.1)	$P = \frac{A}{(1+i)^n}$	Discounting formulas Present value	Use formula 4.1 and the discount tables (App. table 2)
(4.1)	$P = A\ (1+i)^{-n}$		
(6.1)	$P = R\left(\frac{1-(1+i)^{-n}}{i}\right)$	Annuity formula Present value	Use PVUS tables (App. table 3)
(7.1)	$A = R\left(\frac{(1+i)^n-1}{i}\right)$	Annuity formula Future value	Use FVUS tables (App. table 4)

These formulas are basic to solving problems relating to present or future values. Table 5 compares these formulas, using essentially the same basic data. In many problems, you may need to use several formulas.

THE AVERAGE INVESTMENT METHOD

The average investment method should never be used in the analysis of any investment. Almost 100 publications issued by U. S. agricultural experiment stations and State extension services in the 1960's included some analysis of investment costs or costs of ownership. Ninety of them used the average investment method in the analysis. In spite of its wide use by agricultural economists, the average investment method is incompatible with second analysis.6/

6/ Arthur J. Walrath, "The Incompatability of the Average Investment Method for Calculating Interest Cost with the Principle of Alternative opportunities," Southern J. Agr. Econ., Vol. 5, No. 1, July 1973, pp. 181-185.

Table 5--Comparison of results from different formulas

Process	Formula	Given data	Present value	Future value
			--- Dollars ---	
Capitalization	$P = \frac{R}{i}$	$1,000 per year, 8 percent interest	12,500	------
Interest, accumulated	$A = P(1+i)^{n}$	$10,000, 8 percent for 10 years	------	21,589
Discount	$P = A(1+i)^{-n}$	$10,000 in 10 years, 8 percent discount	4,632	------
Annuity	$P = R\left(\frac{1-(1+i)^{-n}}{i}\right)$	$1,000 annually for 10 years, 8 percent	6,710	------
Annuity	$A = R\left(\frac{(1+i)^{n}-1}{i}\right)$	$1,000 annually for 10 years, 8 percent	------	14,487

In the average investment method, the cost of interest is based upon the average of the original cost of the investment and the salvage value of the of the investment. This involves a simple arithmetic calculation. In this method, the time value concept of money is not recognized. Compounding or discounting must be used for sound economic analysis and requires the use of geometric progressions. The basic tables which have been discussed are summation formulas for geometric progressions in which the time value concept of money is recognized.

Results obtained by using the average investment method are always inconsistent with the data as given. If an investor uses this method as the basis for determining the soundness of an investment, he will never recover all his investment or he must accept a lower rate than he used in his calculations. We will illustrate this by applying two methods--the average investment method and the annuity method--to one example.

We are considering an investment of $10,000. This has a life of 5 years with no salvage value. An 8-percent rate is desired. The annual return needed according to the average investment method, is determined by the following formula:

$$R = \left(\frac{C+L}{2}\right) i + \frac{C-L}{n}$$

where: R = annual return
C = original cost
L = salvage value
i = rate
n = years of life

The result is:

$$R = \left(\frac{\$10,000 + 0}{2}\right) (.08) + \frac{\$10,000 - 0}{5}$$

$$= (\$5,000)\ (.08) + \$2,000$$
$$= \$400 + \$2,000$$
$$= \$2,400$$

According to the average investment method, one would need to receive $2,400 annually--$400 for interest on investment and $2,000 for capital recovery--to recover the initial investment at 8 percent interest. This might appear to be reasonable; but, let us develop the annual calculations for this to determine the actual status at the end of the 5th year (table 6). According to data in table 6, $613 of the investment is not recovered. This is correct and arises from the fact that in the average investment method the time value concept of money is not recognized. The average investment method is unsound.

According to the annuity method, the annual return required is:

$$\$10,000 = R \times \left[\frac{1 - (1+.08)^{-5}}{.08}\right]$$

$$= R \times \left[3.9927\right]$$
$$= \$2,505$$

Table 6--Amount of investment outstanding at beginning of year and schedule for interest and capital recovery for an investment of $10,000, at 8 percent, with life of 5 years, and with no salvage value, as calculated by the average investment method

Year	Investment outstanding at beginning of year	Interest on balance[1]	Interest credited[2]	Interest deferred[3]	Excess interest[4]	Amount credited for capital recovery[2]
			Dollars			
1	10,000	800	400	400	--	2,000
2	8,400	672	400	272	--	2,000
3	6,672	534	400	134	--	2,000
4	4,806	384	400	--	16	2,000
5	2,790	223	400	--	177	2,000
6	[5]613	--	--	--	--	--

[1] Based on data given; i.e. interest calculated at 8% on investment.
[2] As determined by average investment method.
[3] Any interest deferred must be considered as additional investment.
[4] Excess interest credited in later years is considered as additional capital recovery.
[5] This is also the balance outstanding at the end of the 5th year even though the asset has no salvage value that can be recovered.

The annual calculations involving the annuity method are shown in table 7. The investment is fully recovered at the end of its life.

With annuity tables readily available, there is no justification for the continued use of the average investment method. Sound analysis requires the use of sound methods. In the analysis of investments, this means the use of compound interest and discount tables and related annuity tables.

EFFECT OF RATES ON PRESENT AND FUTURE VALUES

What is the effect that a lower or a higher interest rate would have on the final results? In the capitalization process, the present value varies inversely with the change in the rate. For example, with an annual return of $1,000, when the rate is increased from 4 percent to 8 percent, the value is reduced from $25,000 to $12,500. On the other hand, cutting the rate in half doubles the value (table 8).

However, in the compound interest or the future value annuity formulas, cutting the interest rate in half does not reduce interest by half except when only one conversion period is involved. Wherever there are two or more conversion periods periods, the amount accruing as interest will be reduced by more than half. In the example, the future value 10 years from now of $10,000 is $21,589 when interest is compounded at 8 percent, but $14,802 when compounded at 4 percent. The amount of interest earned is reduced by 59 percent with the 50-percent reduction in interest rate. Likewise, when the interest rate is doubled, the interest is doubled only when one conversion period is involved. In all other cases, the accumulated interest will be more than doubled. This means that, with any given change in the rate, there is a proportionately greater change in the amount of interest that accumulates.

In the discounting and the present value annuity formulas, similar relationships exist between a change in the rate and the amount of discount. In these formulas, however, a change in the rate results in a proportionately smaller change in the amount of discount. The present value of $10,000 to be received 10 years from now is $4,632 with an 8-percent discount and $6,756 with a 4-percent discount. The discount declined by 46 percent with the 50-percent reduction in the discount rate.

These relationships can be more easily recognized if we take two additional rates--one higher and one lower--and compare results.

Table 8 shows the variations in the present or future amounts for three interest rates. The greatest change is where the payment is allowed to accumulate. For example, the value of $10,000 at the end of 10 years at 4 percent interest is only $14,802. At 8 percent interest, the amount increases to $21,589, or an increment of $6,787 because of the change in interest rate. The amount increases to $31,058 at 12 percent interest, or an increment of $16,256 over the 4-percent rate.

Table 7--Amount of investment outstanding at beginning of year and schedule for interest and capital recovery for an investment of $10,000 at 8 percent, with life of 5 years, and with no salvage value, as calculated by the annuity method

Year	Investment outstanding at beginning of year	Annual return required[1]	Interest on balance[2]	Amount credited for capital recovery[3]
		Dollars		
1	10,000	2,505	800	1,705
2	8,295	2,505	664	1,841
3	6,454	2,505	516	1,989
4	4,465	2,505	357	2,148
5	2,317	2,505	185	2,320
6	[4]2	excess		

[1] As determined by using formula 6.1

[2] Based on data given; i.e. interest calculated at 8% on investment.

[3] This is the difference between $2,505 and interest for any given year.

[4] If this had been carried to the nearest cent, the annual payments would have been $2,054.57 with the last payment of $2,504.53.

Table 8--Effects of changes in rates on present and future value

Process	Given data	Value	Rates		
			4 percent	8 percent	12 percent
			--- Dollars ---		
Capitalization	$1,000 a year	Present	25,000	12,500	8,333
Interest accumulated	$10,000 for 10 years	Future	14,802	21,589	31,058
Discount	$10,000 for 10 years	Present	6,756	4,632	3,220
Annuity	$1,000 annually for 10 years	Present	8,111	6,710	5,650
Annuity	$1,000 annually for 10 years	Future	12,006	14,487	17,549

EFFECT OF TIME ON PRESENT AND FUTURE VALUES

The time period considered in the examples is relatively short, except for capitalization. The time involved, however, is important. It affects the amount of interest or the discount (table 9). For example, $10,000 at 8 percent interest accumulates to $14,693 in 5 years, but to $21,589 in 10 years. The compounding effect, doubling the time period, results in a 147-percent increase in the interest received. This arises because there is interest on interest. Time likewise affects discounting. If $10,000 is discounted for 5 years, it has a present value of $6,806, compared with a present value of $4,632 if discounted for 10 years. Doubling the period results in a 68-percent increase in the discount. The period involved and the rates used are important factors in your analysis.

EFFECTS OF DIVERSE PERIODS ON PRESENT AND FUTURE VALUES

The interest or conversion period in the examples has been identical with the payment period. For many situations, this will not be true. For example, interest might be compounded semiannually with payments made annually. Or payments might be monthly with interest compounded quarterly.

In working with a given sum, the problem is relatively simple. To begin with, two adjustments need to be made. First, the rate needs to be expressed in terms of rate per conversion period. With a rate stated as 8 percent semiannually, this is 4 percent per conversion period. Second, the period involved must be stated in terms of number of conversion periods. With 8 percent semiannually for 10 years, the number of conversion periods would be 20 with 2 in every year.

Table 9--Effects of changes in time on present and future values

Process[1/]	Given data using an 8 percent rate	Value	Time period		
			5 years	10 years	20 years
			--- Dollars ---		
Interest, accumulated	$10,000	Future	14,693	21,589	46,610
Discount	$10,000	Present	6,806	4,632	2,145
Annuity	[2/] $1,000 annually	Present	3,993	6,710	9,818
Annuity	[3/] $1,000 annually	Future	5,867	14,487	45,762

[1/] Capitalization process is not included since n (time) is not a factor in the formula.

[2/] Present value of $2,000 annually for 5 years is $7,985 or $500 for 20 years is $4,909.

[3/] Future value of $2,000 annually for 5 years is $11,733 or $500 for 20 years is $22,881.

For example, the future value of $10,000 invested at 8 percent semiannual interest for 10 years would be calculated from formula 1.1 where P is $10,000, i is 4 percent, and n is 20. The amount, then, would be $10,000 x [2.1911] or $21,911.

Or, the present value of $10,000 discounted for 10 years at 8 percent semiannually would be determined by solving formula 4.1 where P is $10,000, i is 4 percent, and n is 20. Present value would be $10,000 x [.4564] or $4,564.

In working with annuities, however, we must make a third adjustment involving use of a correction factor. The annuity formulas we have used include the term "n," which has been defined as the number of conversion periods for computing interest. The conversion period must be considered as the base period. The periodic payment, the number of payments, and the rate need to be expressed in terms of the conversion period.

We also have a new factor to consider--"p," which is defined as the number of periodical payments in each conversion period. If the rate is computed semiannually and payments are made monthly, p is 6, since there are 6 payments in each conversion period. On the other hand, if the rate is computed semiannually and payments annually, then p is 1/2 since there are two conversion periods for every payment period.

The rate as stated is always an annual rate, but frequently it is computed on a semiannual or a quarterly basis. When the rate is computed on a semiannual basis, one must divide by 2 to obtain the rate per conversion period. For example, 8 percent semiannually is the same as 4 percent for each 6 months, the conversion period. If it is computed on a quarterly basis, then one must divide by 4 to obtain the rate per conversion period.

R is the payment <u>per conversion period</u>. When the payment period is different from the conversion period, then:

$$R = p \times (\text{the periodic payment}).$$

Present Value of an Annuity

In determining the present value of an annuity, we used formula 6.1 when the conversion period was the same as the payment period. When these periods are not the same, we need to use a correction factor. This factor is shown as $\left[\frac{i}{j_p}\right]$. It is found in Appendix 5 for selected i values and p values and is applied to the standard annuity formula. The revised formula now becomes:

$$(8.1) \qquad P = R \left(\frac{i}{j_p}\right) \left(\frac{1-(1+i)^{-n}}{i}\right)$$

where: P = present value
R = payment per conversion period
i = discount rate per conversion period
n = number of conversion periods
p = number of payments per conversion period
$\frac{i}{j_p}$ = correction factor (taken from App. table 5)

Take the example that was used in the section on present value of an annual return for a given time (page 8), but with one change. In the example, we had a 9-percent annual discount. Change this to a semiannual rate. The conversion period now is 6 months.

In the problem, we want to determine the present value of $1,000 annually and we have the following data:

R = $500 (1/2 of $1,000)
i = 4.5 percent
n = 20
p = 1/2

In using equation 8.1 we need to use two appendix tables. The $\left[\frac{i}{j_p}\right]$ is taken from Appendix 5. For an i value of 4.5 percent and a p value of 1/2, the factor is 0.9780. The annuity factor $\left[\frac{1-(1+i)^{-n}}{i}\right]$ is taken from the PVUS tables, Appendix 3, part 5. For an i value of 4.5 percent and an n value of 20, the factor is 13.0079. Using equation 8.1, we have:

$$P = \$500 \times \left[.9780\right] \times \left[13.0079\right]$$

$$= \$6,361$$

With discount computed semiannually instead of annually, the present value of the annuity is reduced slightly.

To make further comparisons, let us change the frequency of the periodic payment and use a 9-percent annual rate. The basic data are:

Periodic payment = $500 every 6 months
i = 9 percent annually (conversion period is 1 year)
n = 10
p = 2
R = $1,000

We solve P using equation 8.1.

$$P = \$1,000 \times \left[1.0227\right] \times \left[6.4177\right]$$

$$= \$6,563$$

With more frequent payments, the present value has increased. Comparisons of present value for these and other periods are shown in table 10.

Table 10--Variations in present value of an annuity for 10 years, arising from variations in frequency of payments and in frequency of interest conversions

Payment	9 percent interest or discount computed	Present value
Dollars		Dollars
1,000 annually	Annually	6,418
1,000 annually	Semiannually	6,361
1,000 annually	Quarterly	6,332
500 semiannually	Annually	6,563
500 semiannually	Semiannually	6,504
500 semiannually	Quarterly	6,476
250 quarterly	Annually	6,594
250 quarterly	Semiannually	6,576
250 quarterly	Quarterly	6,548

Future Value of an Annuity

Future values are determined in a similar way. The identical correction factor is used. The basic formula with the correction factor is:

$$A = R\left(\frac{i}{j_p}\right)\left(\frac{(1+i)^n-1}{i}\right) \tag{9.1}$$

where: A = future value
R = payment per conversion period
i = interest rate per conversion period
n = number of conversion periods
p = number of payments per conversion period
$\frac{i}{j_p}$ = correction factor

Let us take the same problem from the previous section, but this time determine the future value. The rate is 9 percent semiannually and payment is $1,000 annually for 10 years. The conversion period is 6 months. The basic data is:

R = $500
i = 4.5 percent
n = 20
p = 1/2

For formula 9.1, the correction factor $\left[\frac{i}{j_p}\right]$ is taken from App. table 5 and the annuity factor $\left[\frac{(1+i)^n-1}{i}\right]$ is taken from the FVUS tables (App. table 4). We have:

$$A = \$500 \times \left[.9780\right] \times \left[31.3714\right]$$

$$= \$15,341$$

In the second problem, the periodic payment is $500 every 6 months with interest computed at 9 percent per annum. We solve for A with

$$A = \$1,000 \times \left[1.0227\right] \times \left[15.1929\right]$$

$$= \$15,538$$

Table 11 shows the comparisons of the amount of the annuity with variations in the conversion periods and payment periods.

Table 11--Variations in amount of an annuity for 10 years, arising from variations in frequency of payments and in frequency of interest conversions

Payment	9 percent interest or discount computed	Amount
Dollars		Dollars
1,000 annually	Annually	15,193
1,000 annually	Semiannually	15,341
1,000 annually	Quarterly	15,419
500 semiannually	Annually	15,538
500 semiannually	Semiannually	15,686
500 semiannually	Quarterly	15,750
250 quarterly	Annually	15,609
250 quarterly	Semiannually	15,860
250 quarterly	Quarterly	15,947

RETURNS VS. COSTS

In working with the annuities, we defined R as the total periodic payment within a conversion period. In working with interest or discount, we referred to the present or future value of a given amount. For many, this nomenclature is misleading. Examples we have used have been expressed largely as investments. Many investments also involve costs that occur in various time periods. Costs are analyzed in the same way. Actually, we can consider the periodic payment as a quantity that can move in either direction. It can be a sum that is paid in, as an income, or it can be a sum that is paid out, as a cost.

For example, if you have a series of annual costs, present value of these costs can be determined by using formula 6.1, or the future value of these costs can be determined by using formula 7.1. Likewise, if you have a series of annual returns, present value can be determined by using formula 6.1, or future value by using formula 7.1. Whether the payment is a cost or income, the analysis involves use of the same formula.

The main problem in dealing with costs and returns is to analyze what is involved and to classify the various items properly.

ANALYZING THE DATA AVAILABLE

Regardless of the problem, it will be impossible for you to arrive at any sound decision until you analyze the data that relate to the problem. Figure 1 can be used as a guide for analyzing the data and for determining what formula to use. Four distinct steps are involved:

1. Classification of Payments

In the first step, payments are classified into one of two types: (1) those paid in or considered as income, and (2) those paid out or considered costs. Income and costs normally must be handled separately unless they occur simultaneously and can be combined and expressed as a net income or net loss at a given time. If annual costs are involved, but income occurs irregularly, the two need to be handled separately in determining present or future values. They can be combined to develop a net figure after the present or future values have been determined. On the other hand, if annual costs and annual income are involved, then these can be combined into a net figure, and the present or future values of these net figures can be determined. In most work, however, it is advisable to keep income and costs separate until the final calculations. So the first step is to choose between the two classifications, income or costs.

2. Frequency of Payments

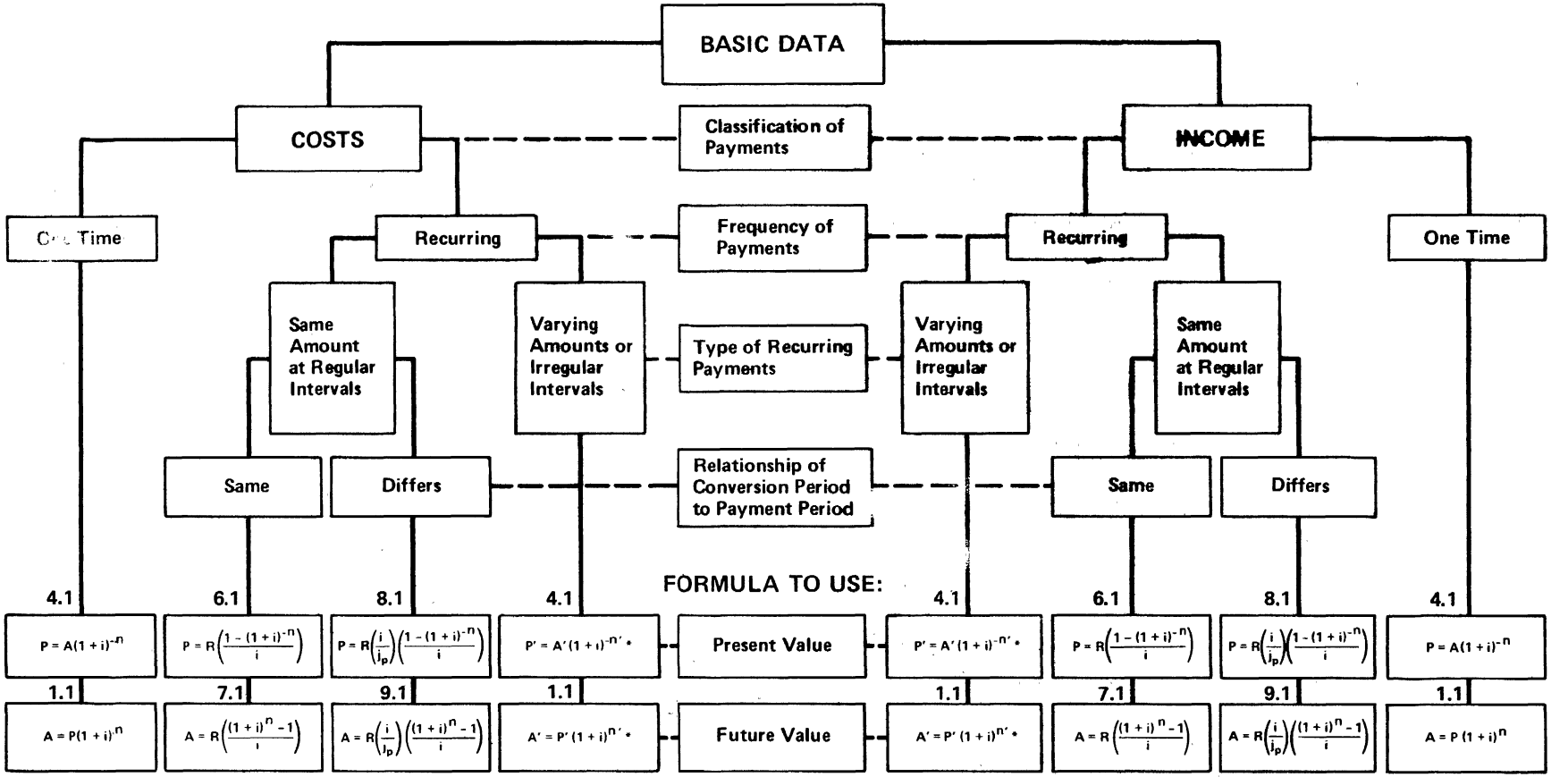
Both costs and income must be subclassed as to the frequency of occurrence. If the payment occurs only once, the formula that you use can be determined without any additional steps. If payments are recurring, you face further choice: do they occur at regular intervals or at irregular intervals?

If the payments are at irregular intervals you can immediately determine what formula to use from figure 1. In problems of this type, each payment will need to be handled separately.

3. Conversion Period and Payment Period

With constant amounts paid at regular intervals, one additional step is required. One needs to determine whether the conversion period is the same as

Fig. 1 CLASSIFICATION OF DATA AND FORMULAS USED



**CALCULATE FOR EACH ITEM OF COST OR INCOME WHERE THE PAYMENT IS EITHER IN VARYING AMOUNTS OR PAID AT IRREGULAR INTERVALS*

the payment period or whether the periods differ. You follow the chart to determine the proper formula.

4. The Formula To Use

After the data have been classified in this manner, you will have the choice of using one of two formulas. The decision of whether to use the formula to determine present value or the formula to determine future value will depend partly on the particular problem. In some cases, you are definitely concerned with a future value; for example, accumulation of funds to meet future expenses. However, in many problems, you will want to relate future payments to the present and this means you will normally use the formulas giving present values.

In examining figure 1, you will find that income is analyzed in exactly the same way as costs.

THE RATES TO USE

There is no one rate that should be used. Many individuals might use different rates for interest, discount, and capitalization. Actually, many can justify having several different rates just for discounting or compounding.

If you borrow money, you know that you will have to pay a certain cost for the use of it. Let us assume that this is stated at 9.5 percent per year. The lender, in offering this rate to you, based it upon a number of factors. In addition to the cost of money to himself, he considered the risks and uncertainties that might be involved, the liquidity[7/] of the loan, and the potential variation in income. A loan for investments involving risks and uncertainties, low liquidity, or variation in income will require a higher rate of interest than one largely unaffected by these factors. The 9.5-percent rate reflects his appraisal of how these factors will affect the investment you make.

You as a borrower or as an investor are also concerned with these three factors. Variations in income can result in a smaller return for your labor and management and it might even affect your ability to meet certain financial obligations. Lack of liquidity can also affect you. Whenever your assets are tied up this restricts your ability to take advantage of other investment opportunities that might arise. Certain risks are insurable and you can protect yourself by having them insured. However, uncertainties do exist and these increase with the life of the investment. Whenever you make an investment, you want to strive to obtain a return from it that is at least equal to similar investments.

7/ "Liquidity" refers to the ease of converting the loan or investment to cash.

SOME EXAMPLES OF EVALUATION OF INVESTMENT OPPORTUNITIES

Although the following problems are stated in terms of specific types of situations, similar types of problems are faced by all businessmen. Many individuals and families are also confronted with situations requiring similar analysis. In these problems, various rates are used to emphasize the fact that there is no one rate that should be used.

Examples are given of the procedure that one must follow. No question is fully answered. Certain assumptions are made in presenting these problems. In actual situations, these assumptions must be based upon an analysis of the investment being considered. It is not sound to assume, if you buy additional land, for example, that your net income will increase proportionally with the increase in acreage or some other factor. Detailed analysis of the total business should be made to estimate changes in costs and returns for the entire operation.

The assumptions you make in regard to your investment possibilities must be reasonable.

Problem: How Much Do You Need to Save?

You want to build up a cash reserve to cover an anticipated major expense at a future date or as an emergency reserve. You decide that your goal is to have a savings account of $5,000 at the end of 5 years. Assume that you can set money aside monthly and that it can earn 5.5 percent interest paid semiannually. How much do you need to save each month?

These data need to be classified in terms of figure 1 in order to determine what formula or formulas need to be used. Figure 2, based on figure 1, illustrates the type of classification that must be made. From this classification, we know that you are concerned with a future value and the formula that must be used is:

(9.1) $$A = R\left(\frac{i}{j_p}\right)\left(\frac{(1+i)^n-1}{i}\right)$$

where: A = $5,000
n = 10 (there are two conversion periods per year)
i = 2.75 percent (1/2 of 5.5 percent) interest per conversion period
p = 6 (6 payments in each conversion period)
W = the unknown monthly payment
R = 6W (6 payments in each conversion period)

We solve for R in the equation:

$$\$5{,}000 = R \times \left[\frac{0.0275}{j_6}\right] \times \left[\frac{1.0275^{10}-1}{0.0275}\right]$$

$$= R \times \left[1.0114\right] \times \left[11.3328\right]$$

$5,000 = R x (11.4620)
R = $436.22
W = $72.70

If you deposit $72.70 monthly in a savings account earning 5.5 percent semiannually, you will have $5,000 in that account at the end of 5 years. The total amount you would have deposited over this time is $4,362.00.8/ If payments are made semiannually, an additional $50.00 must be deposited over the 5-year period (table 12). If the money is deposited at 5 percent interest, the monthly or semiannual payments must be slightly greater.

Table 12--Process of accumulating $5,000 in 5 years at 5 percent or 5.5 percent interest and with monthly or semiannual payments

Payment required	Interest computed semiannually	Total amount paid in
	Percent	Dollars
$72.70 monthly	5.5	4,362.00
$441.20 semiannually	5.5	4,412.00
$73.62 monthly	5	4,417.20
$446.29 semiannually	5	4,462.90

Problem: A Subscription for 1, 2, or 3 Years?

On my desk is a form showing that a subscription to this magazine will cost $9 for 1 year, $16 for 2 years, or $20 for 3 years. Which is the best buy, assuming a 6-percent discount rate? First let us look at the cost of the 2-year subscription.

The alternative to a 2-year subscription is the payment of $9 now and $9 a year from now. This problem involves two sets of data, one for the first annual subscription and one for the renewal. The initial subscription involves a present cost and there is no need to classify this further. The renewal costs, however, need to be classified and this is done in figure 3.

For a cost that occurs only once with the conversion period the same as the payment period, we need to use the following formula to determine the present value:

$$P = A \quad (1+i)^{-n} \tag{4.1}$$

8/ It is assumed that annual tax liability on the interest earned will come out of personal income and not from savings account. However, tax liability should be considered when alternative investments are being analyzed.

Fig. 2 BASED ON FIG. 1

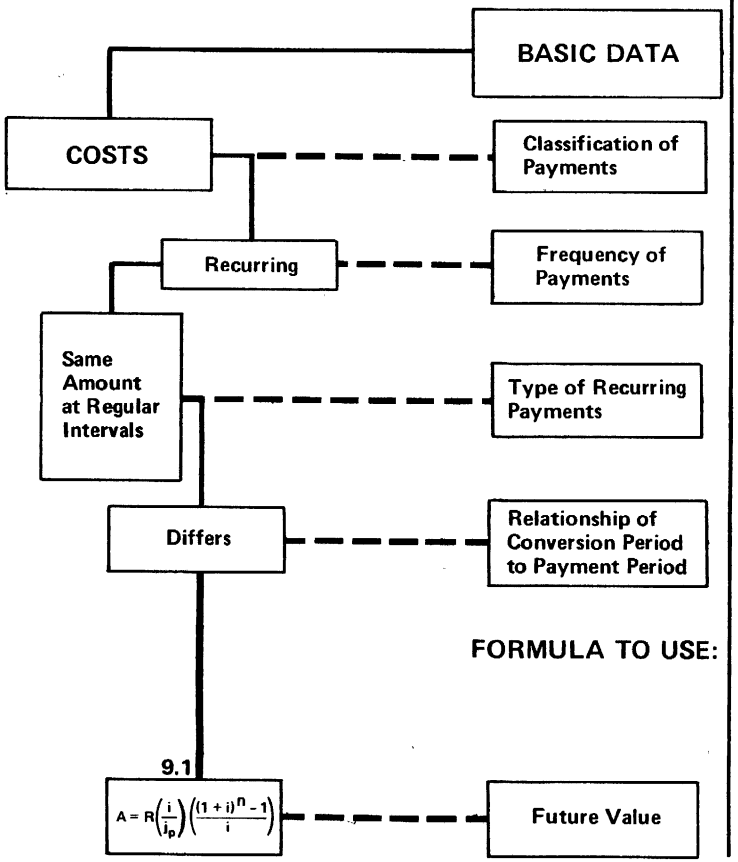
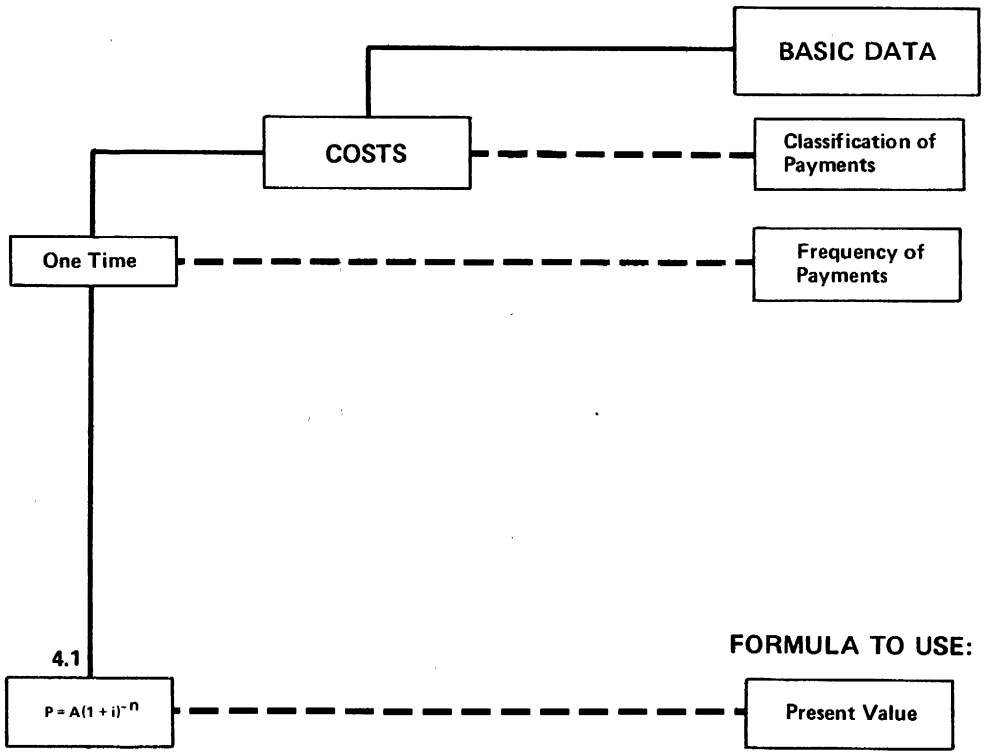


Fig. 3 BASED ON FIG. 1



where: $A = \$9$
$i = 6$ percent
$n = 1$

$$P = \$9 \left[(1.06)^{-1}\right]$$

$$= \$9 \left[(.9434)\right]$$

$$= \$8.49$$

With a \$9 cost for the original subscription, the present value of the cost for two annual subscriptions is \$17.49, compared to \$16 for a 2-year subscription. The latter is definitely a better buy.

Another way to look at this is to determine what return I would need to get on \$7 (the difference between the 2-year subscription and the 1-year subscription) so I would have \$9 at the end of the first year to renew the subscription. Here we can use formula 1.1 and solve for i.

$$\$9 = \$7\ (1+i)$$
$$i = 28.57 \text{ percent}$$

Buying a 2-year subscription is the same as getting a return of 28.75 percent on the additional \$7 required.

A 3-year subscription is an even better buy. The alternative to a 3-year subscription is paying \$9 today, \$9 a year from now, and \$9 2 years from now. Again, we have two sets of data. There is the cost of the initial subscription, which is a present value. Then there are two additional payments. The classification of the renewal data is presented in figure 4.

From this classification we know that the formula to use to calculate the present value of the second set of data is:

(6.1)
$$P = R\left(\frac{1-(1+i)^{-n}}{i}\right)$$

where: $R = \$9$
$n = 2$
$i = 6$ percent

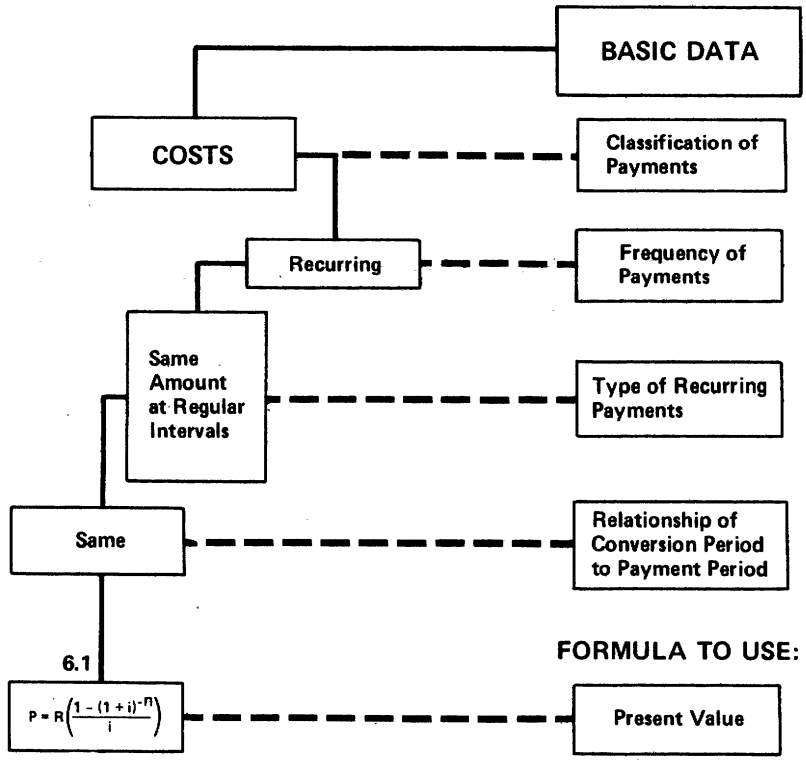
$$P = \$9 \times \left[\frac{1-(1+.06)^{-2}}{.06}\right]$$

$$= \$9 \times \left[1.8334\right]$$

$$= \$16.50$$

This is the present cost of the two renewals after the original subscription. The total present cost for three consecutive annual subscriptions is \$25.50 compared to \$20 for a 3-year subscription. A 3-year subscription requires an additional outlay of \$11 at the beginning. If I invested this, I would need to receive a return in excess of 40 percent in order to have sufficient funds to buy annual subscriptions over the next 2 years.

Fig. 4 BASED ON FIG. 1



Problem: Annual Membership Fees or a Life Membership?

Is a life membership in an organization a better buy than an annual membership? Naturally, this depends partly on how long you live after acquiring life membership. It also depends upon your discount rate.

You must compare the present value of a series of annual membership fees with the cost of the life membership. Let us take the case where the life membership fee is $150 and the annual membership fee is $10. Let us also assume that you will be a member for 20 years and that your interest rate is 6 percent. You want to compare the cost of a life membership with the cost of an annual membership renewed for 19 years. The problem involves calculating the present value of the annual membership.

You will find that two sets of data are involved. There is the cost of the initial subscription. There is also the cost of the renewals starting a year later. Since the cost of the initial subscription is a present value, there is no need to classify the set of data. The classification of the costs of the renewals is the same as presented in figure 4. Calculation of the present value of the renewals involves this formula:

(6.1) $$P = R\left(\frac{1-(1+i)^{-n}}{i}\right)$$

where: R = $10
n = 19
i = 6 percent

Substituting the given values, you have

$$P = \$10 \times \left[\frac{1-(1+.06)^{-19}}{.06}\right]$$

$$= \$10 \times \left[11.1581\right]$$

$$= \$111.58$$

To this must be added the cost of the initial subscription. This means that the present value of an annual membership renewed for 19 years is $121.58 compared with $150 for a life membership. A life membership costing $150 definitely would not be a good buy if you anticipate being a member for only 20 years. Actually, $150 invested in a life membership, which you anticipate is of value to you for only 20 years, yields a 3.3-percent return.

If you can earn 6 percent on your investment and the annual membership is $10 and you estimate that you might have need for this membership for 20 years, it would be a better buy for you to invest $112 elsewhere than in a life membership. You could withdraw $10 each year for 19 years before the fund was completely exhausted. With annual dues of $10 or a life membership fee of $150, paying annual dues will be more economical unless you anticipate renewing your membership for more than 31 years.

Problem: Should You Buy This Equipment?

As a businessman, you often face a choice among various pieces of equipment. You will need to: (1) know the original cost of the investment, (2) estimate annual operating and maintenance costs, (3) estimate the additional income tax liability arising from the use of the investment, (4) estimate the value of the output of the asset, and (5) determine what you anticipate as the life of the asset and its salvage value.

Let us assume that after studying the possibilities, you consider the following, which we will call Alternative A.

	Dollars
Cost of the equipment installed, less the present value of any investment credit permitted	10,500
Salvage value at the end of 12 years	1,500
Operating, maintenance, insurance cost, etc.	3,000 annually
Value of production	5,500 annually

In your calculations, you plan to use straight-line depreciation. The first step involves calculating your additional income tax liability. Assuming that all items of operating, maintenance, and insurance are deductable items, we need to add to this the amount of depreciation[9/] to obtain total deductions. The following calculation gives additional taxable income:

	Dollars	
Value of production		5,500
less operating costs	3,000	
less depreciation	750	
		3,750
Additional taxable income		1,750

If you are in the 32-percent tax bracket; the additional income tax liability amounts to $560.

At this point you can determine your annual net cash income after taxes. This involves the following calculations:

	Dollars	
Gross income		5,500
less annual operating assets	3,000	
less income taxes	560	
		3,560
Net cash income after taxes		1,940

At this point, you need to classify this net cash income after taxes; this can be done in the same manner as previously. We have a return that is recurring, that is constant at regular intervals, and where the conversion period and payment period are identical. We are interested in a present value. The classification is the same as shown in figure 4, except this involves a return and not a cost. However, channelizing this classification in figure 1 shows that the same formula is used:

$$(6.1) \qquad P = R\left(\frac{1-(1+i)^{-n}}{i}\right)$$

where: $R = \$1,940$
$n = 12$
$i = 10$ percent

We find that:

$$P = \$1,940 \times \left[\frac{1-(1+.10)^{-12}}{.10}\right]$$

$$= \$1,940 \times [6.8137]$$

$$= \$13,218.58$$

[9/] This is total cost less salvage value divided by years of life.

This is the present value of the annual income that would be derived from investment in Alternative A. There is also a salvage value. Classification of the salvage value is the same as shown in figure 3; this requires use of this formula:

$$(4.1) \qquad P = A \quad (1+i)^{-n}$$

where: R = \$1,500
n = 12
i = 10 percent

Present value of the salvage value is:

$$P = \$1,500 \left[(1+.10)^{-12}\right]$$
$$= \$1,500 \times \left[.3186\right]$$
$$= \$477.90$$

The total of these two items, \$13,696, is the present value of all income that would flow from this investment in Alternative A. With the data as given, it would appear that this would be a good investment since only \$10,500 is required for the original investment.

Choosing between two or more alternatives. But, you also wish to consider Alternative B and have compiled the following information:

	Dollars
Cost of equipment, less present value of any investment credit	9,000
Salvage value at end of 10 years	1,000
Operating and maintenance costs	2,400 annually
Value of production	5,000 annually

Following the same procedure, we find his taxable income increases by \$1,800 with an additional tax liability of \$576. Net income after taxes amounts to \$2,024 annually. The present value of this is \$12,436.67 and the present value of the salvage is \$385.50. Total present value of all net income amounts to \$12,822.17. Again, this appears to be a good investment.

But the question to the businessman is: which is the better investment, the one costing \$9,000 (Alternative B) and having a flow of income over 10 years with a present value of \$12,822 or one costing \$10,500 (Alternative A) with a flow of income over 12 years with a present value of \$13,696.48. This can be done by comparing the relationship of the present value of the flow of income to the cost of the investment for each alternative. Even though the present value of the flow of income from Alternative A is greater than from

Alternative B, the latter is the better choice. Alternative B produces an income flow that is 42.5 percent greater than the investment. Alternative A has an income flow that is only 30.4 percent greater (table 13). The smaller investment with the 10-year life is better.

Table 13--Comparison of alternative investment opportunities

Item	Alternative A	Alternative B
	Years	
Life	12	10
	Dollars	
Original cost of investment	10,500	9,000
Salvage value	1,500	1,000
Annual net cash return	1,940	2,024
Present value of income flow	13,696	12,822
	Percent	
Present value of income flow compared to original cost	130.4	142.5

Problem: Should the Farmer Buy Additional Land?

A farmer wishing to buy more land must estimate the additional annual net income that will arise with this purchase. He will need to determine how long a repayment period he wants. He needs to know the interest rate he will have to pay. The farmer will have certain additional risks associated with farm production as well as uncertainties and risks relating to farm operation.

Let us assume that the land has a firm cost of $25,000 and the farmer can pay $10,000 down. Let us also assume that the farmer wants to repay the loan over a 10-year period and that money can be borrowed at 9.0 percent. Risks, uncertainties, variations in income, and lack of liquidity raise the total rate to 10.5 percent.

The data we now have can be classified. We have a cost that is recurring and that will involve equal annual payments with the conversion period same as the payment period. This also involves a present value. The classification is the same as shown in figure 4. This means that we need to use formula 6.1 where P = $15,000, n = 10, and i = 10.5 percent. Solving for R, we have:

$$15{,}000 = R \times \left[\frac{1-(1+10.5)^{-10}}{10.5}\right]$$

$$= R \times \left[6.1048\right]$$

$$R = \$2{,}494$$

The farmer will need an additional $2,494 annually to amortize the loan and to cover other costs. This allows $2,337 for the amortization of the $15,000 debt and $157 for the risks, uncertainties, and lack of liquidity (table 14).

The problem stated that the farmer wants to repay the loan in 10 years. What would be the effect if the farmer decided to finance such a loan over a 20-year term? He would need an additional net return of only $1,822 compared with $2,494. His costs would be reduced by $672 during the first 10 years. Offsetting this reduction would be the 10 additional payments of $1,643 on the loan during the second 10 years. The longer loan requires an additional $9,490 for interest on the $15,000 borrowed.

Problem: When Should You Sell Your Land?

Decisions relating to the sale of land near urbanizing areas must be made in an atmosphere of considerable speculation in which you, the landowner, must estimate the future price for your land. The question should be reexamined frequently in areas of rapid economic growth.

You should first examine your present situation. In this appraisal, for example, you might estimate that your land would sell for $50,000 today and that you are receiving 7 percent on your investment, or $3,500 annually. You also estimate that if you were to sell the land today, your capital gains tax and other costs in transferring your investment from land to some other use would total $5,000, leaving you a net of $45,000 from the sale. Also, if you were to sell, you would need an alternative use for your labor and nonreal estate capital that would yield a return at least equal to that earned today. In your appraisal, you realize that suitable alternative uses are available.

The question whether you should sell depends in part on what you expect land prices to be in the future. If you expect no rise in land prices, you would be better off financially to sell when you could obtain an annual return in excess of $3,500 on the $45,000 in some alternative investment. This would be a return of at least 7.8 percent on the $45,000.

However, if the area is one with considerable residential, commercial, or industrial activity, it would be normal to expect some rise in land prices. One can only speculate as to what this rise will be over the next 5 or 10 years. Let us assume that your land that will sell for $50,000 today can be sold in 10 years for $105,000.

You also need to make some estimates of the various costs that will be associated with the sale of this property in another 10 years. These costs will include a capital gains tax and the expenses of the sale and transfer of land. You assume that these costs will be $18,600. The net available, after paying these costs, would be $86,400, compared with a net of $45,000 if you were to sell the land today. If these assumptions are correct, you would receive an additional $41,400 net from the sale of the land by waiting 10 years. Should you wait or sell it now?

Table 14--Costs of borrowing $15,000 for 10 years at 9 percent interest and with additional costs of 1.5 percent

Year	Balance beginning of year	9 percent interest of loan	Reduction on principal	Costs of loan	1.5 percent additional costs[1/]	Total annual costs
			Dollars			
1	15,000	1,350	987	2,337	157	2,494
2	14,013	1,261	1,076	2,337	157	2,494
3	12,937	1,164	1,173	2,337	157	2,494
4	11,764	1,059	1,278	2,337	157	2,494
5	10,486	944	1,393	2,337	157	2,494
6	9,093	818	1,519	2,337	157	2,494
7	7,574	682	1,655	2,337	157	2,494
8	5,919	533	1,804	2,337	157	2,494
9	4,115	370	1,967	2,337	157	2,494
10	2,148	193	2,148	2,341[2/]	157	2,498[2/]

[1/] Includes risks, uncertainties, variations in income, and lack of liquidity. A reserve fund should be set up to meet these costs.

[2/] Difference is due to the fact that calculations were made to the nearest dollar.

The answer depends largely on alternative opportunities for the $45,000 that you would net today. Can you invest $45,000 now and obtain a return that will maintain the present return and provide an additional return that will yield $41,400 at the end of 10 years? In this analysis, you decide to use a 7.5-percent rate. How much additional return per year would you need so that this investment would increase by $41,400 at the end of 10 years?

This analysis of the problem enables us to classify the data according to figure 1. We find we have two sets of data. First, there is the current flow of income of $3,500 a year. Second, there is the additional flow of income that will accumulate to $41,400 at the end of 10 years. This second set of data is classified in figure 5. From this, we can see that we must use formula 7.1 since we are concerned with a future value. With A = $41,400, n = 10, and i = 7.5 percent, we have:

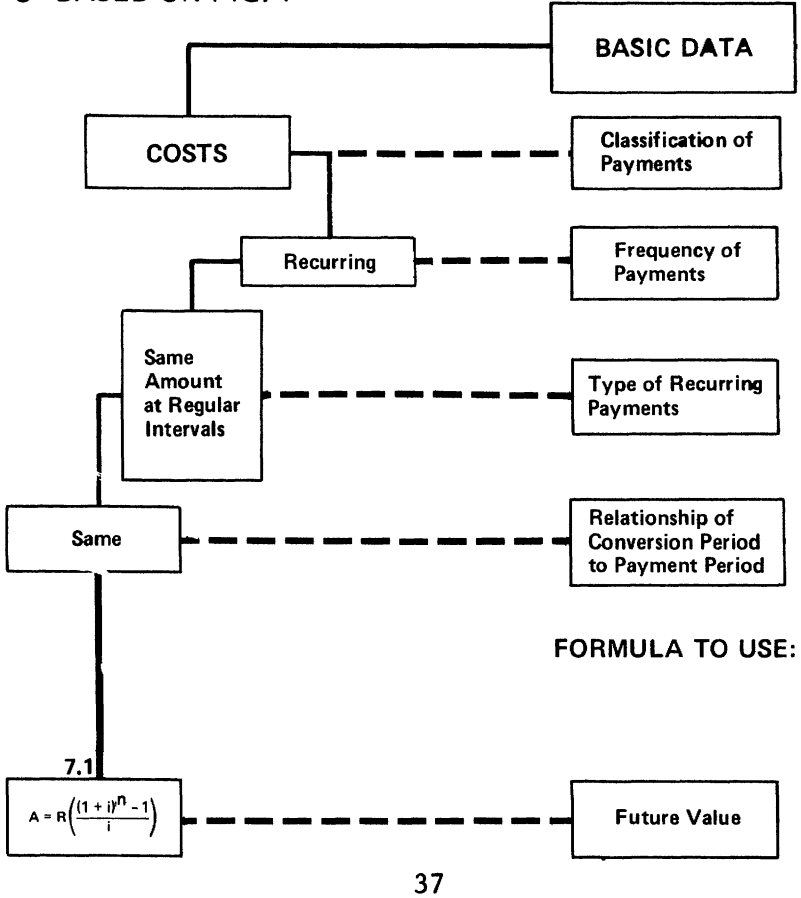
$$\$41,400 = R \times \left[\frac{(1+.075)^{10}-1}{.075}\right]$$

$$= R \times \left[14.1471\right]$$

$$R = \$2,926.39$$

The $2,926 is the additional annual return you need to make it profitable to sell today. However, the additional $2,926 and annual interest increment will be subject to personal Federal income tax and possibly State income tax.

Fig. 5 BASED ON FIG. 1



Your additional annual personal tax liability could be 36 percent or more on the additional income. If the income tax liability amounts to 36 percent, you would have an additional tax of $1,646 in the first year and of $3,156 in the last year on this additional income.10/

At present, you are receiving an annual income of $3,500 from the current investment. You want to continue to receive this return, but you must also receive annually an additional $2,926 plus an amount equivalent to your tax liability on the additional income. The situation, year by year, is shown on table 15. Actually, instead of a 7.5-percent return as used in the calculations, you must receive a return of 18 percent in the first year and a return of 15 percent on your investment during the 10th year.

In summary, under the given assumptions, you would not be economically justified in selling your land unless you can find an alternative source of investment that will yield an annual return in excess of $8,072 on the $45,000 that could be obtained from the sale of the farm today.

Problem: What is the Value of Pastureland?

You estimate it will cost $70 per acre to establish a good pasture with a life of 10 years. You also estimate that annual costs for taxes, fertilizer, fencing, clipping, and other items are $21 per acre and that annual returns are $45 per acre. With a 7-percent discount rate and a 10-percent capitalization rate, what is this pastureland worth?

The classification in this problem involves three sets of data. First, there is the cost of establishing the pasture. This is a present value and requires no further calculations. The second set of data includes the annual cost and the third set annual returns. These two data sets are classified in figure 6. Even though one set of data involves costs and the other returns, we find that formula 6.1 must be used for both sets of data.

Costs: The present value of $21 per year at 7 percent is determined from the following equation:

$$P = \$21 \times \left[\frac{1-(1+.07)^{-10}}{.07}\right]$$

$$= \$21 \times \left[7.0236\right]$$

$$= \$147.50$$

Adding the cost of establishing the pasture gives a total cost of $217.50.

10/One can calculate the amount needed by using the following formula: $G(1-t) = N$, where G is the income on which the tax is paid, or the unknown in this case; t is equal to the tax rate or 36%; and N is the net income after taxes or $2,926.

Table 15--Year-by-year process of maintaining an annual income of $3,500 and of accumulating $86,400 in 10 years from an original investment of $45,000

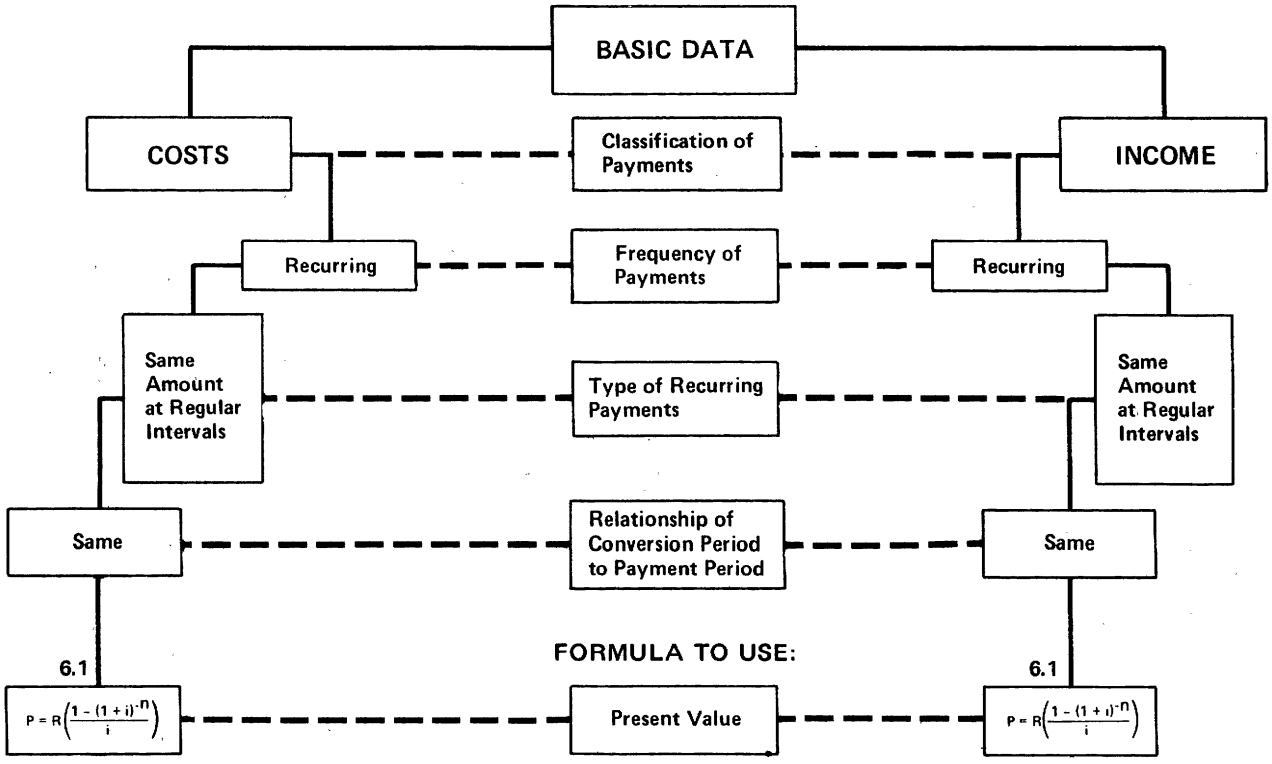
Year	Amount of investment at beginning of year	Maintenance of present annual returns	Return for capital accumulation[1/]	Additional annual tax liabilities[2/]	Total returns needed
			Dollars		
1	45,000	3,500	2,926	1,646	8,072
2	47,926	3,500	3,145	1,769	8,414
3	51,071	3,500	3,381	1,902	8,783
4	54,452	3,500	3,635	2,045	9,180
5	58,087	3,500	3,908	2,198	9,606
6	61,995	3,500	4,201	2,363	10,064
7	66,196	3,500	4,516	2,540	10,556
8	70,712	3,500	4,855	2,731	11,086
9	75,567	3,500	5,219	2,936	11,655
10	80,786	3,500	5,610	3,156	12,266
11	[3/] 86,396	- - -	- - -	- - -	- - -

[1/] 7-1/2 % rate is used.

[2/] It is assumed that additional personal tax liability will amount to 36% additional income. However, it is necessary to recognize that under the current tax rate schedule, the rate increases with an increase in taxable income.

[3/] Amount of investment at the end of the 10th year. Figures do not total $86,400 because of rounding.

Fig. 6 BASED ON FIG. 1



Returns: The present value of $45 annually for 10 years is determined in the same manner:

$$P = \$45 \times \left[\frac{1-(1+.07)^{-10}}{.07}\right]$$

$$= \$45 \times \left[7.0236\right]$$

$$= \$316.06$$

Value of land: To determine the value of the land, we first need to obtain the net return which is $98.56. This is a return from the use of the land over the 10-year period. This return needs to be expressed as an annual net return. In this situation, we have a present value and the unknown is a recurring constant with conversion period the same as the payment period. From figure 1 we find that formula 6.1 must be used to solve for R. We have:

$$\$98.56 = R \times \left[\frac{1-(1+.07)^{-10}}{.07}\right]$$

$$= R \times \left[7.0236\right]$$

$$R = \$14.03$$

Pasture yields a return of $14.03 per acre. You will need to decide what part of this is returned as profit for establishing sod and what part is return to land. If, as is frequently done, all is considered as return to land, and if

it is assumed that this is a 10-year rotation that can be maintained indefinitely, the capitalized value of land with a 10-percent rate is $140 (formula 5.1).

Problem: What About Growing Christmas Trees?

In evaluating possibilities of growing Christmas trees, a landowner estimated that it would be necessary to incur costs as shown in table 16. These costs would be incurred at various times over an 8-year period. These costs must be converted to present values in order to make an adequate evaluation. The owner, because of the risks involved, was willing to accept 12 percent as a minimum return on his investment.

This problem involves many steps, outlined in table 17. This, however, is not an unusual situation. Many investment opportunities will have costs and returns in varying amounts over a number of years and evaluation of the investment can involve many steps.

There are two main ways to determine present values of all costs. In this example, it might be easier to take the costs for each year, as shown in table 16, and discount the costs to the present. For example, in year 5, there is a cost of $114 (which we have assumed is incurred at the beginning of the year). This needs to be discounted for 4 years to obtain the present value. Thus, the present value is:

$$P_5 = \$114 \times \left[(1+.12)^{-4}\right]$$

$$= \$114 \times \left[.6355\right]$$

$$= \$72.45$$

The discounted costs for each year is shown in table 16. The total value of all these costs is $756.10.

The identical figure can be obtained by working with the costs of each item as listed in table 16 and calculating the present value of all costs relating to that time. Take the cost of shearing as an example. We can recognize this as an annuity whose present value can be calculated to the beginning of year 2 and then that amount discounted for one year to obtain the present value at the beginning of year 1. However, an adjustment needs to be made since this cost can be reported as a deductible item on income tax returns. At a 25-percent tax rate, the tax is reduced by $15, leaving a net cost of $45. The steps needed to obtain the present value of this are presented in table 17.11/

Likewise, the present value of the other cost items can be obtained by using the formulas shown in table 17. The present value of all these costs is the same as derived in the previous calculations.

11/Since it is assumed that the tax rate remains constant, the adjustment could have been made after calculating the present value of the $60 costs for 7 years.

Table 16--Estimated costs per acre for Christmas tree production by years

Item	Year 1/								
	1	2	3	4	5	6	7	8	9
	Dollars								
Site preparation	33								
Seedling/planting	125	18							
Mowing		24	24	24	24	16	16	16	16
Shearing/pruning			60	60	60	60	60	60	60
Insecticide			19			19			
Herbicide				14					
Fertilization							15		
Miscellaneous	20		8		26				
Harvesting/marketing								126	645
Property tax, fencing, etc.	4	4	4	4	4	4	4	4	4
Total	182	46	115	102	114	99	95	206	725
Reduction in income tax 2/	6	7	28.75	25.50	28.50	24.75	23.75	51.50	181.25
Net cost	176	39	86.25	76.50	85.50	74.25	71.25	154.50	543.75
Present value of net cost	176	34.82	68.76	54.45	54.34	42.13	36.10	69.88	219.62

1/ It is assumed that all costs are incurred at the beginning of the year. This means that items incurred in year 2 need to be discounted only 1 year to obtain a present value.

2/ It is also assumed that the operator during the growing period is in the 25% tax bracket and that he can report all cost items except the first two as deductable items in his income tax return.

Table 17—Procedure for determining present values for Christmas tree enterprise

Cost item	Procedure to use	Formula to use[1]	Calculate[2]	Present value
				Dollars
Site preparation	None for $33	None	None	33.00
Seedlings/planting	a) None for $125	None	None	125.00
	b) $18, discounted 1 year	4.1	18(.8929)	16.07
Mowing[3]	a) Present value of $24 annuity for 4 years	6.1	24(3.0373)	72.90
	b) Present value of $16 annuity for 4 years	6.1	16(3.0373)	- -
	c) Above discounted 4 years	4.1	48.60(.6355)	30.89
Shearing/pruning[3]	a) Present value of $60 annuity for 7 years	6.1	60(4.5638)	- -
	b) Above discounted 1 year	4.1	273.83(.8929)	244.50
Insecticide[3]	a) $19.00, discounted 2 years	4.1	19.00(.7972)	15.15
	b) $19.00, discounted 5 years	4.1	19.00(.5674)	10.78
Herbicide[3]	$14.00, discounted 3 years	4.1	14.00(.7118)	9.97
Fertilizer[3]	$15.00, discounted 6 years	4.1	15.00(.5066)	7.60
Miscellaneous[3]	a) None for $20	- -	- -	20.00
	b) $8, discounted 2 years	4.1	8(.7972)	6.38
	c) $26.00, discounted 4 years	4.1	26.00(.6355)	16.52
Harvesting/mkt.[3]	a) $126.00, discounted 7 years	4.1	126.00(.4523)	56.99
	b) $645.00, discounted 8 years	4.1	645.00(.4039)	260.52
Taxes, fencing, etc.[3]	a) None for $4	- -	- -	4.00
	b) Present value of $4 annuity for 8 years	6.1	4(4.9676)	19.87
Total	- -	- -	- -	[3]950.14

[1] From figure 1.

[2] All figures in parenthesis come from the appendix tables.

[3] To determine net cost after taxes, take the first two items--site preparation ($33) and seedlings and planting ($125 plus $16.07)--as given and 75% of all other items, mowing through taxes and fencing. The total will be identical to that in table 16.

Revenue also must be considered. The owner estimated that in the 8th year, he would receive $523 from sales and in the following year $4,734. He also estimated that his tax liability would reduce this income to $450 and $3,836 respectively. The present value of these, using formula 4.1, are $203.54 and $1,549.36 respectively, or a total of $1,752.90.

The net return from this activity is $996.81. To compare this net return with returns from alternative enterprises, this figure needs to be converted to an annual figure over the 8-year rotation. This is done by using formula 6.1, where the present value is $996.81; the period is 8; and the rate is 12 percent. We solve for R in the following manner:

$$\$996.81 = R \times \left[\frac{1-(1.12)^{-8}}{12}\right]$$

$$= R \times \left[4.9676\right]$$

$$R = \$200.66$$

Thus, the operator may expect, with these given assumptions, $200.66 as an annual net return to land and management for this activity.

Appendix table 1: The Amount of 1--The $\left[(1+i)^n\right]$ table

Part 1.--Amount of 1 where n is 1 to 60 and i is 5/12, 5.5/12, .5, 6.5/12, 7/12, 7.25/12, 7.5/12, 7.75/12, and 2/3 percent

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.75/12	2/3	
1	1.0042	1.0046	1.0050	1.0054	1.0058	1.0060	1.0063	1.0065	1.0067	1
2	1.0084	1.0092	1.0100	1.0109	1.0117	1.0121	1.0125	1.0130	1.0134	2
3	1.0126	1.0138	1.0151	1.0163	1.0176	1.0182	1.0189	1.0195	1.0201	3
4	1.0168	1.0185	1.0202	1.0218	1.0235	1.0244	1.0252	1.0261	1.0269	4
5	1.0210	1.0231	1.0253	1.0274	1.0295	1.0306	1.0316	1.0327	1.0338	5
6	1.0253	1.0278	1.0304	1.0329	1.0355	1.0368	1.0381	1.0394	1.0407	6
7	1.0295	1.0325	1.0355	1.0385	1.0416	1.0431	1.0446	1.0461	1.0476	7
8	1.0338	1.0373	1.0407	1.0442	1.0476	1.0494	1.0511	1.0528	1.0546	8
9	1.0381	1.0420	1.0459	1.0498	1.0537	1.0557	1.0577	1.0596	1.0616	9
10	1.0425	1.0468	1.0511	1.0555	1.0599	1.0621	1.0643	1.0665	1.0687	10
11	1.0468	1.0516	1.0564	1.0612	1.0661	1.0685	1.0709	1.0734	1.0758	11
12	1.0512	1.0564	1.0617	1.0670	1.0723	1.0750	1.0776	1.0803	1.0830	12
13	1.0555	1.0612	1.0670	1.0728	1.0785	1.0815	1.0844	1.0873	1.0902	13
14	1.0599	1.0661	1.0723	1.0786	1.0848	1.0880	1.0911	1.0943	1.0975	14
15	1.0644	1.0710	1.0777	1.0844	1.0912	1.0946	1.0980	1.1014	1.1048	15
16	1.0688	1.0759	1.0831	1.0903	1.0975	1.1012	1.1048	1.1085	1.1122	16
17	1.0732	1.0808	1.0885	1.0962	1.1039	1.1078	1.1117	1.1157	1.1196	17
18	1.0777	1.0858	1.0939	1.1021	1.1104	1.1145	1.1187	1.1229	1.1270	18
19	1.0822	1.0908	1.0994	1.1081	1.1168	1.1213	1.1257	1.1301	1.1346	19
20	1.0867	1.0958	1.1049	1.1141	1.1234	1.1280	1.1327	1.1374	1.1421	20
21	1.0912	1.1008	1.1104	1.1201	1.1299	1.1348	1.1398	1.1448	1.1497	21
22	1.0958	1.1058	1.1160	1.1262	1.1365	1.1417	1.1469	1.1521	1.1574	22
23	1.1004	1.1109	1.1216	1.1323	1.1431	1.1486	1.1541	1.1596	1.1651	23
24	1.1049	1.1160	1.1272	1.1384	1.1498	1.1555	1.1613	1.1671	1.1729	24
25	1.1095	1.1211	1.1328	1.1446	1.1565	1.1625	1.1686	1.1746	1.1807	25
26	1.1142	1.1263	1.1385	1.1508	1.1633	1.1695	1.1759	1.1822	1.1886	26
27	1.1188	1.1314	1.1442	1.1570	1.1700	1.1766	1.1832	1.1898	1.1965	27
28	1.1235	1.1366	1.1499	1.1633	1.1769	1.1837	1.1906	1.1975	1.2045	28
29	1.1282	1.1418	1.1556	1.1696	1.1837	1.1909	1.1980	1.2053	1.2125	29
30	1.1329	1.1470	1.1614	1.1759	1.1906	1.1981	1.2055	1.2130	1.2206	30

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.75/12	2/3	
31	1.1376	1.1523	1.1672	1.1823	1.1976	1.2053	1.2131	1.2209	1.2287	31
32	1.1423	1.1576	1.1730	1.1887	1.2046	1.2126	1.2206	1.2288	1.2369	32
33	1.1471	1.1629	1.1789	1.1951	1.2116	1.2199	1.2283	1.2367	1.2452	33
34	1.1519	1.1682	1.1848	1.2016	1.2187	1.2273	1.2359	1.2447	1.2535	34
35	1.1567	1.1736	1.1907	1.2081	1.2258	1.2347	1.2437	1.2527	1.2618	35
36	1.1615	1.1789	1.1967	1.2147	1.2329	1.2422	1.2514	1.2608	1.2702	36
37	1.1663	1.1844	1.2027	1.2213	1.2401	1.2497	1.2593	1.2690	1.2787	37
38	1.1712	1.1898	1.2087	1.2279	1.2474	1.2572	1.2671	1.2771	1.2872	38
39	1.1761	1.1952	1.2147	1.2345	1.2546	1.2648	1.2751	1.2854	1.2958	39
40	1.1810	1.2007	1.2208	1.2412	1.2619	1.2724	1.2830	1.2937	1.3045	40
41	1.1859	1.2062	1.2269	1.2479	1.2693	1.2801	1.2910	1.3021	1.3131	41
42	1.1908	1.2117	1.2330	1.2547	1.2767	1.2879	1.2991	1.3105	1.3219	42
43	1.1958	1.2173	1.2392	1.2615	1.2842	1.2956	1.3072	1.3189	1.3307	43
44	1.2008	1.2229	1.2454	1.2683	1.2917	1.3035	1.3154	1.3274	1.3396	44
45	1.2058	1.2285	1.2516	1.2752	1.2992	1.3113	1.3236	1.3360	1.3485	45
46	1.2108	1.2341	1.2579	1.2821	1.3068	1.3193	1.3319	1.3446	1.3575	46
47	1.2158	1.2398	1.2642	1.2890	1.3144	1.3272	1.3402	1.3533	1.3666	47
48	1.2209	1.2455	1.2705	1.2960	1.3221	1.3353	1.3486	1.3621	1.3757	48
49	1.2260	1.2512	1.2768	1.3030	1.3298	1.3433	1.3570	1.3709	1.3848	49
50	1.2311	1.2569	1.2832	1.3101	1.3375	1.3514	1.3655	1.3797	1.3941	50
51	1.2362	1.2627	1.2896	1.3172	1.3453	1.3596	1.3740	1.3886	1.4034	51
52	1.2414	1.2684	1.2961	1.3243	1.3532	1.3678	1.3826	1.3976	1.4127	52
53	1.2465	1.2743	1.3026	1.3315	1.3611	1.3761	1.3913	1.4066	1.4221	53
54	1.2517	1.2801	1.3091	1.3387	1.3690	1.3844	1.4000	1.4157	1.4316	54
55	1.2570	1.2860	1.3156	1.3460	1.3770	1.3928	1.4087	1.4248	1.4412	55
56	1.2622	1.2919	1.3222	1.3533	1.3850	1.4012	1.4175	1.4341	1.4508	56
57	1.2674	1.2978	1.3288	1.3606	1.3931	1.4096	1.4264	1.4433	1.4604	57
58	1.2727	1.3037	1.3355	1.3680	1.4012	1.4182	1.4353	1.4526	1.4702	58
59	1.2780	1.3097	1.3421	1.3754	1.4094	1.4267	1.4443	1.4620	1.4800	59
60	1.2834	1.3157	1.3489	1.3828	1.4176	1.4354	1.4533	1.4715	1.4898	60

Part 2.--Amount of 1 where n is 1 to 60 and i is 8.25/12, 8.5/12, 8.75/12, .75, 9.25/12, 9.5/12, 9.75/12, 5/6, and 10.25/12 percent

	8.25/12	8.5/12	8.75/12	.75	9.25/12	9.5/12	9.75/12	5/6	10.25/12	
1	1.0069	1.0071	1.0073	1.0075	1.0077	1.0079	1.0081	1.0083	1.0085	1
2	1.0138	1.0142	1.0146	1.0151	1.0155	1.0159	1.0163	1.0167	1.0172	2
3	1.0208	1.0214	1.0220	1.0227	1.0233	1.0239	1.0246	1.0252	1.0258	3
4	1.0278	1.0286	1.0295	1.0303	1.0312	1.0320	1.0329	1.0338	1.0346	4
5	1.0349	1.0359	1.0370	1.0381	1.0391	1.0402	1.0413	1.0424	1.0434	5
6	1.0420	1.0433	1.0446	1.0459	1.0472	1.0485	1.0498	1.0511	1.0524	6
7	1.0491	1.0506	1.0522	1.0537	1.0552	1.0568	1.0583	1.0598	1.0613	7
8	1.0563	1.0581	1.0598	1.0616	1.0634	1.0651	1.0669	1.0686	1.0704	8
9	1.0636	1.0656	1.0676	1.0696	1.0716	1.0735	1.0755	1.0775	1.0796	9
10	1.0709	1.0731	1.0754	1.0776	1.0798	1.0820	1.0843	1.0865	1.0888	10
11	1.0783	1.0807	1.0832	1.0857	1.0881	1.0906	1.0931	1.0956	1.0981	11
12	1.0857	1.0884	1.0911	1.0938	1.0965	1.0992	1.1020	1.1047	1.1075	12
13	1.0932	1.0961	1.0991	1.1020	1.1050	1.1079	1.1109	1.1139	1.1169	13
14	1.1007	1.1039	1.1071	1.1103	1.1135	1.1167	1.1200	1.1232	1.1265	14
15	1.1082	1.1117	1.1151	1.1186	1.1221	1.1256	1.1291	1.1326	1.1361	15
16	1.1159	1.1196	1.1233	1.1270	1.1307	1.1345	1.1382	1.1420	1.1458	16
17	1.1235	1.1275	1.1315	1.1354	1.1394	1.1435	1.1475	1.1515	1.1556	17
18	1.1313	1.1355	1.1397	1.1440	1.1482	1.1525	1.1568	1.1611	1.1654	18
19	1.1390	1.1435	1.1480	1.1525	1.1571	1.1616	1.1662	1.1708	1.1754	19
20	1.1469	1.1516	1.1564	1.1612	1.1660	1.1708	1.1757	1.1805	1.1854	20
21	1.1547	1.1598	1.1648	1.1699	1.1750	1.1801	1.1852	1.1904	1.1956	21
22	1.1627	1.1680	1.1733	1.1787	1.1840	1.1894	1.1949	1.2003	1.2058	22
23	1.1707	1.1763	1.1819	1.1875	1.1932	1.1989	1.2046	1.2103	1.2161	23
24	1.1787	1.1846	1.1905	1.1964	1.2024	1.2083	1.2144	1.2204	1.2265	24
25	1.1868	1.1930	1.1992	1.2054	1.2116	1.2179	1.2242	1.2306	1.2369	25
26	1.1950	1.2014	1.2079	1.2144	1.2210	1.2276	1.2342	1.2408	1.2475	26
27	1.2032	1.2099	1.2167	1.2235	1.2304	1.2373	1.2442	1.2512	1.2582	27
28	1.2115	1.2185	1.2256	1.2327	1.2399	1.2471	1.2543	1.2616	1.2689	28
29	1.2198	1.2271	1.2345	1.2420	1.2494	1.2569	1.2645	1.2721	1.2797	29
30	1.2282	1.2358	1.2435	1.2513	1.2591	1.2669	1.2748	1.2827	1.2907	30

	8.25/12	8.5/12	8.75/12	3/4	9.25/12	9.5/12	9.75/12	5/6	10.25/12	
31	1.2366	1.2446	1.2526	1.2607	1.2688	1.2769	1.2851	1.2934	1.3017	31
32	1.2451	1.2534	1.2617	1.2701	1.2785	1.2870	1.2956	1.3042	1.3128	32
33	1.2537	1.2623	1.2709	1.2796	1.2884	1.2972	1.3061	1.3150	1.3240	33
34	1.2623	1.2712	1.2802	1.2892	1.2983	1.3075	1.3167	1.3260	1.3353	34
35	1.2710	1.2802	1.2895	1.2989	1.3083	1.3178	1.3274	1.3370	1.3467	35
36	1.2797	1.2893	1.2989	1.3086	1.3184	1.3283	1.3382	1.3482	1.3582	36
37	1.2885	1.2984	1.3084	1.3185	1.3286	1.3388	1.3491	1.3594	1.3698	37
38	1.2974	1.3076	1.3180	1.3283	1.3388	1.3494	1.3600	1.3707	1.3815	38
39	1.3063	1.3169	1.3276	1.3383	1.3491	1.3601	1.3711	1.3822	1.3933	39
40	1.3153	1.3262	1.3372	1.3483	1.3595	1.3708	1.3822	1.3937	1.4053	40
41	1.3243	1.3356	1.3470	1.3585	1.3700	1.3817	1.3934	1.4053	1.4173	41
42	1.3334	1.3451	1.3568	1.3686	1.3806	1.3926	1.4048	1.4170	1.4294	42
43	1.3426	1.3546	1.3667	1.3789	1.3912	1.4037	1.4162	1.4288	1.4416	43
44	1.3518	1.3642	1.3767	1.3893	1.4020	1.4148	1.4277	1.4407	1.4539	44
45	1.3611	1.3739	1.3867	1.3997	1.4128	1.4260	1.4393	1.4527	1.4663	45
46	1.3705	1.3836	1.3968	1.4102	1.4236	1.4373	1.4510	1.4648	1.4788	46
47	1.3799	1.3934	1.4070	1.4207	1.4346	1.4486	1.4628	1.4770	1.4915	47
48	1.3894	1.4033	1.4173	1.4314	1.4457	1.4601	1.4747	1.4894	1.5042	48
49	1.3990	1.4132	1.4276	1.4421	1.4568	1.4717	1.4866	1.5018	1.5170	49
50	1.4086	1.4232	1.4380	1.4530	1.4681	1.4833	1.4987	1.5143	1.5300	50
51	1.4183	1.4333	1.4485	1.4639	1.4794	1.4951	1.5109	1.5269	1.5431	51
52	1.4280	1.4434	1.4591	1.4748	1.4908	1.5069	1.5232	1.5396	1.5563	52
53	1.4378	1.4537	1.4697	1.4859	1.5023	1.5188	1.5355	1.5525	1.5695	53
54	1.4477	1.4640	1.4804	1.4970	1.5138	1.5308	1.5480	1.5654	1.5830	54
55	1.4577	1.4743	1.4912	1.5083	1.5255	1.5430	1.5606	1.5784	1.5965	55
56	1.4677	1.4848	1.5021	1.5196	1.5373	1.5552	1.5733	1.5916	1.6101	56
57	1.4778	1.4953	1.5130	1.5310	1.5491	1.5675	1.5861	1.6049	1.6239	57
58	1.4879	1.5059	1.5241	1.5425	1.5611	1.5799	1.5989	1.6182	1.6377	58
59	1.4982	1.5166	1.5352	1.5540	1.5731	1.5924	1.6119	1.6317	1.6517	59
60	1.5085	1.5273	1.5464	1.5657	1.5852	1.6050	1.6250	1.6453	1.6658	60

Part 3.--Amount of 1 where n is 1 to 60 and i is 10.5/12, 10.75/12, 11/12, 11.25/12, 11.5/12, 11.75/12, 1.0, 1.25, and 1.5 percent

	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	1.0	1.25	1.5	
1	1.0088	1.0090	1.0092	1.0094	1.0096	1.0098	1.0100	1.0125	1.0150	1
2	1.0176	1.0180	1.0184	1.0188	1.0193	1.0197	1.0201	1.0252	1.0302	2
3	1.0265	1.0271	1.0278	1.0284	1.0290	1.0297	1.0303	1.0380	1.0457	3
4	1.0355	1.0363	1.0372	1.0380	1.0389	1.0397	1.0406	1.0509	1.0614	4
5	1.0445	1.0456	1.0467	1.0478	1.0488	1.0499	1.0510	1.0641	1.0773	5
6	1.0537	1.0550	1.0563	1.0576	1.0589	1.0602	1.0615	1.0774	1.0934	6
7	1.0629	1.0644	1.0660	1.0675	1.0690	1.0706	1.0721	1.0909	1.1098	7
8	1.0722	1.0740	1.0757	1.0775	1.0793	1.0811	1.0829	1.1045	1.1265	8
9	1.0816	1.0836	1.0856	1.0876	1.0896	1.0917	1.0937	1.1183	1.1434	9
10	1.0910	1.0933	1.0955	1.0978	1.1001	1.1023	1.1046	1.1323	1.1605	10
11	1.1006	1.1031	1.1056	1.1081	1.1106	1.1131	1.1157	1.1464	1.1779	11
12	1.1102	1.1130	1.1157	1.1185	1.1213	1.1240	1.1268	1.1608	1.1956	12
13	1.1199	1.1229	1.1259	1.1290	1.1320	1.1350	1.1381	1.1753	1.2136	13
14	1.1297	1.1330	1.1363	1.1396	1.1429	1.1462	1.1495	1.1900	1.2318	14
15	1.1396	1.1431	1.1467	1.1502	1.1538	1.1574	1.1610	1.2048	1.2502	15
16	1.1496	1.1534	1.1572	1.1610	1.1649	1.1687	1.1726	1.2199	1.2690	16
17	1.1596	1.1637	1.1678	1.1719	1.1760	1.1802	1.1843	1.2351	1.2880	17
18	1.1698	1.1741	1.1785	1.1829	1.1873	1.1917	1.1961	1.2506	1.3073	18
19	1.1800	1.1847	1.1893	1.1940	1.1987	1.2034	1.2081	1.2662	1.3270	19
20	1.1903	1.1953	1.2002	1.2052	1.2102	1.2152	1.2202	1.2820	1.3469	20
21	1.2008	1.2060	1.2112	1.2165	1.2218	1.2271	1.2324	1.2981	1.3671	21
22	1.2113	1.2168	1.2223	1.2279	1.2335	1.2391	1.2447	1.3143	1.3876	22
23	1.2219	1.2277	1.2335	1.2394	1.2453	1.2512	1.2572	1.3307	1.4084	23
24	1.2326	1.2387	1.2448	1.2510	1.2572	1.2635	1.2697	1.3474	1.4295	24
25	1.2433	1.2498	1.2562	1.2627	1.2693	1.2758	1.2824	1.3642	1.4509	25
26	1.2542	1.2610	1.2678	1.2746	1.2814	1.2883	1.2953	1.3812	1.4727	26
27	1.2652	1.2723	1.2794	1.2865	1.2937	1.3009	1.3082	1.3985	1.4948	27
28	1.2763	1.2837	1.2911	1.2986	1.3061	1.3137	1.3213	1.4160	1.5172	28
29	1.2874	1.2952	1.3029	1.3108	1.3186	1.3265	1.3345	1.4337	1.5400	29
30	1.2987	1.3068	1.3149	1.3231	1.3313	1.3395	1.3478	1.4516	1.5631	30

	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	1.0	1.25	1.5	
31	1.3101	1.3185	1.3269	1.3355	1.3440	1.3526	1.3613	1.4698	1.5865	31
32	1.3215	1.3303	1.3391	1.3480	1.3569	1.3659	1.3749	1.4881	1.6103	32
33	1.3331	1.3422	1.3514	1.3606	1.3699	1.3793	1.3887	1.5067	1.6345	33
34	1.3447	1.3542	1.3638	1.3734	1.3830	1.3928	1.4026	1.5256	1.6590	34
35	1.3565	1.3664	1.3763	1.3862	1.3963	1.4064	1.4166	1.5446	1.6839	35
36	1.3684	1.3786	1.3889	1.3992	1.4097	1.4202	1.4308	1.5639	1.7091	36
37	1.3804	1.3909	1.4016	1.4124	1.4232	1.4341	1.4451	1.5835	1.7348	37
38	1.3924	1.4034	1.4145	1.4256	1.4368	1.4481	1.4595	1.6033	1.7608	38
39	1.4046	1.4160	1.4274	1.4390	1.4506	1.4623	1.4741	1.6233	1.7872	39
40	1.4169	1.4287	1.4405	1.4525	1.4645	1.4766	1.4889	1.6436	1.8140	40
41	1.4293	1.4415	1.4537	1.4661	1.4785	1.4911	1.5038	1.6642	1.8412	41
42	1.4418	1.4544	1.4670	1.4798	1.4927	1.5057	1.5188	1.6850	1.8688	42
43	1.4544	1.4674	1.4805	1.4937	1.5070	1.5204	1.5340	1.7060	1.8969	43
44	1.4672	1.4805	1.4941	1.5077	1.5214	1.5353	1.5493	1.7274	1.9253	44
45	1.4800	1.4938	1.5078	1.5218	1.5360	1.5504	1.5648	1.7489	1.9542	45
46	1.4929	1.5072	1.5216	1.5361	1.5507	1.5655	1.5805	1.7708	1.9835	46
47	1.5060	1.5207	1.5355	1.5505	1.5656	1.5809	1.5963	1.7929	2.0133	47
48	1.5192	1.5343	1.5496	1.5650	1.5806	1.5963	1.6122	1.8154	2.0435	48
49	1.5325	1.5481	1.5638	1.5797	1.5958	1.6120	1.6283	1.8380	2.0741	49
50	1.5459	1.5619	1.5781	1.5945	1.6110	1.6278	1.6446	1.8610	2.1052	50
51	1.5594	1.5759	1.5926	1.6095	1.6265	1.6437	1.6611	1.8843	2.1368	51
52	1.5731	1.5900	1.6072	1.6245	1.6421	1.6598	1.6777	1.9078	2.1689	52
53	1.5868	1.6043	1.6219	1.6398	1.6578	1.6760	1.6945	1.9317	2.2014	53
54	1.6007	1.6187	1.6368	1.6552	1.6737	1.6925	1.7114	1.9558	2.2344	54
55	1.6147	1.6332	1.6518	1.6707	1.6897	1.7090	1.7285	1.9803	2.2679	55
56	1.6288	1.6478	1.6669	1.6863	1.7059	1.7258	1.7458	2.0050	2.3020	56
57	1.6431	1.6625	1.6822	1.7021	1.7223	1.7427	1.7633	2.0301	2.3365	57
58	1.6575	1.6774	1.6976	1.7181	1.7388	1.7597	1.7809	2.0555	2.3715	58
59	1.6720	1.6925	1.7132	1.7342	1.7554	1.7769	1.7987	2.0812	2.4071	59
60	1.6866	1.7076	1.7289	1.7505	1.7723	1.7943	1.8167	2.1072	2.4432	60

Part 4.--Amount of 1 where n is 1 to 60 and i is 1.75, 2.0, 2.25, 2.5, 2.75, 3.0, 4.0, 4.5, and 5.0 percent

	1.75	2.0	2.25	2.5	2.75	3.0	4.0	4.5	5.0	
1	1.0175	1.0200	1.0225	1.0250	1.0275	1.0300	1.0400	1.0450	1.0500	1
2	1.0353	1.0404	1.0455	1.0506	1.0558	1.0609	1.0816	1.0920	1.1025	2
3	1.0534	1.0612	1.0690	1.0769	1.0848	1.0927	1.1249	1.1412	1.1576	3
4	1.0719	1.0824	1.0931	1.1038	1.1146	1.1255	1.1699	1.1925	1.2155	4
5	1.0906	1.1041	1.1177	1.1314	1.1453	1.1593	1.2167	1.2462	1.2763	5
6	1.1097	1.1262	1.1428	1.1597	1.1768	1.1941	1.2653	1.3023	1.3401	6
7	1.1291	1.1487	1.1685	1.1887	1.2091	1.2299	1.3159	1.3609	1.4071	7
8	1.1489	1.1717	1.1948	1.2184	1.2424	1.2668	1.3686	1.4221	1.4775	8
9	1.1690	1.1951	1.2217	1.2489	1.2765	1.3048	1.4233	1.4861	1.5513	9
10	1.1894	1.2190	1.2492	1.2801	1.3117	1.3439	1.4802	1.5530	1.6289	10
11	1.2103	1.2434	1.2773	1.3121	1.3477	1.3842	1.5395	1.6229	1.7103	11
12	1.2314	1.2682	1.3060	1.3449	1.3848	1.4258	1.6010	1.6959	1.7959	12
13	1.2530	1.2936	1.3354	1.3785	1.4229	1.4685	1.6651	1.7722	1.8856	13
14	1.2749	1.3195	1.3655	1.4130	1.4620	1.5126	1.7317	1.8519	1.9799	14
15	1.2972	1.3459	1.3962	1.4483	1.5022	1.5580	1.8009	1.9353	2.0789	15
16	1.3199	1.3728	1.4276	1.4845	1.5435	1.6047	1.8730	2.0224	2.1829	16
17	1.3430	1.4002	1.4597	1.5216	1.5860	1.6528	1.9479	2.1134	2.2920	17
18	1.3665	1.4282	1.4926	1.5597	1.6296	1.7024	2.0258	2.2085	2.4066	18
19	1.3904	1.4568	1.5262	1.5987	1.6744	1.7535	2.1068	2.3079	2.5270	19
20	1.4148	1.4859	1.5605	1.6386	1.7204	1.8061	2.1911	2.4117	2.6533	20
21	1.4395	1.5157	1.5956	1.6796	1.7677	1.8603	2.2788	2.5202	2.7860	21
22	1.4647	1.5460	1.6315	1.7216	1.8164	1.9161	2.3699	2.6337	2.9253	22
23	1.4904	1.5769	1.6682	1.7646	1.8663	1.9736	2.4647	2.7522	3.0715	23
24	1.5164	1.6084	1.7058	1.8087	1.9176	2.0328	2.5633	2.8760	3.2251	24
25	1.5430	1.6406	1.7441	1.8539	1.9704	2.0938	2.6658	3.0054	3.3864	25
26	1.5700	1.6734	1.7834	1.9003	2.0245	2.1566	2.7725	3.1407	3.5557	26
27	1.5975	1.7069	1.8235	1.9478	2.0802	2.2213	2.8834	3.2820	3.7335	27
28	1.6254	1.7410	1.8645	1.9965	2.1374	2.2879	2.9987	3.4297	3.9201	28
29	1.6539	1.7758	1.9065	2.0464	2.1962	2.3566	3.1187	3.5840	4.1161	29
30	1.6828	1.8114	1.9494	2.0976	2.2566	2.4273	3.2434	3.7453	4.3219	30

	1.75	2.0	2.25	2.5	2.75	3.0	4.0	4.5	5.0	
31	1.7122	1.8476	1.9933	2.1500	2.3187	2.5001	3.3731	3.9139	4.5380	31
32	1.7422	1.8845	2.0381	2.2038	2.3824	2.5751	3.5081	4.0900	4.7649	32
33	1.7727	1.9222	2.0840	2.2589	2.4479	2.6523	3.6484	4.2740	5.0032	33
34	1.8037	1.9607	2.1308	2.3153	2.5153	2.7319	3.7943	4.4664	5.2533	34
35	1.8353	1.9999	2.1788	2.3732	2.5844	2.8139	3.9461	4.6673	5.5160	35
36	1.8674	2.0399	2.2278	2.4325	2.6555	2.8983	4.1039	4.8774	5.7918	36
37	1.9001	2.0807	2.2779	2.4933	2.7285	2.9852	4.2681	5.0969	6.0814	37
38	1.9333	2.1223	2.3292	2.5557	2.8036	3.0748	4.4388	5.3262	6.3855	38
39	1.9672	2.1647	2.3816	2.6196	2.8807	3.1670	4.6164	5.5659	6.7048	39
40	2.0016	2.2080	2.4352	2.6851	2.9599	3.2620	4.8010	5.8164	7.0400	40
41	2.0366	2.2522	2.4900	2.7522	3.0413	3.3599	4.9931	6.0781	7.3920	41
42	2.0723	2.2972	2.5460	2.8210	3.1249	3.4607	5.1928	6.3516	7.7616	42
43	2.1085	2.3432	2.6033	2.8915	3.2108	3.5645	5.4005	6.6374	8.1497	43
44	2.1454	2.3901	2.6619	2.9638	3.2991	3.6715	5.6165	6.9361	8.5572	44
45	2.1830	2.4379	2.7218	3.0379	3.3899	3.7816	5.8412	7.2482	8.9850	45
46	2.2212	2.4866	2.7830	3.1139	3.4831	3.8950	6.0748	7.5744	9.4343	46
47	2.2600	2.5363	2.8456	3.1917	3.5789	4.0119	6.3178	7.9153	9.9060	47
48	2.2996	2.5871	2.9096	3.2715	3.6773	4.1323	6.5705	8.2715	10.4013	48
49	2.3398	2.6388	2.9751	3.3533	3.7784	4.2562	6.8333	8.6437	10.9213	49
50	2.3808	2.6916	3.0420	3.4371	3.8823	4.3839	7.1067	9.0326	11.4674	50
51	2.4225	2.7454	3.1105	3.5230	3.9891	4.5154	7.3910	9.4391	12.0408	51
52	2.4648	2.8003	3.1805	3.6111	4.0988	4.6509	7.6866	9.8639	12.6428	52
53	2.5080	2.8563	3.2520	3.7014	4.2115	4.7904	7.9941	10.3077	13.2749	53
54	2.5519	2.9135	3.3252	3.7939	4.3273	4.9341	8.3138	10.7716	13.9387	54
55	2.5965	2.9717	3.4000	3.8888	4.4463	5.0821	8.6464	11.2563	14.6356	55
56	2.6420	3.0312	3.4765	3.9860	4.5686	5.2346	8.9922	11.7628	15.3674	56
57	2.6882	3.0918	3.5547	4.0856	4.6942	5.3917	9.3519	12.2922	16.1358	57
58	2.7352	3.1536	3.6347	4.1878	4.8233	5.5534	9.7260	12.8453	16.9426	58
59	2.7831	3.2167	3.7165	4.2925	4.9560	5.7200	10.1150	13.4234	17.7897	59
60	2.8318	3.2810	3.8001	4.3998	5.0923	5.8916	10.5196	14.0274	18.6792	60

Part 5.--Amount of 1 where n is 1 to 60 and i is 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, and 9.0 percent

	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	
1	1.0550	1.0600	1.0650	1.0700	1.0750	1.0800	1.0850	1.0900	1
2	1.1130	1.1236	1.1342	1.1449	1.1556	1.1664	1.1772	1.1881	2
3	1.1742	1.1910	1.2079	1.2250	1.2423	1.2597	1.2773	1.2950	3
4	1.2388	1.2625	1.2865	1.3108	1.3355	1.3605	1.3859	1.4116	4
5	1.3070	1.3382	1.3701	1.4026	1.4356	1.4693	1.5037	1.5386	5
6	1.3788	1.4185	1.4591	1.5007	1.5433	1.5869	1.6315	1.6771	6
7	1.4547	1.5036	1.5540	1.6058	1.6590	1.7138	1.7701	1.8280	7
8	1.5347	1.5938	1.6550	1.7182	1.7835	1.8509	1.9206	1.9926	8
9	1.6191	1.6895	1.7626	1.8385	1.9172	1.9990	2.0839	2.1719	9
10	1.7081	1.7908	1.8771	1.9672	2.0610	2.1589	2.2610	2.3674	10
11	1.8021	1.8983	1.9992	2.1049	2.2156	2.3316	2.4532	2.5804	11
12	1,9012	2.0122	2.1291	2.2522	2.3818	2.5182	2.6617	2.8127	12
13	2.0058	2.1329	2.2675	2.4098	2.5604	2.7196	2.8879	3.0658	13
14	2.1161	2.2609	2.4149	2.5785	2.7524	2.9372	3.1334	3.3417	14
15	2.2325	2.3966	2.5718	2.7590	2.9589	3.1722	3.3997	3.6425	15
16	2.3553	2.5404	2.7390	2.9522	3.1808	3.4259	3.6887	3.9703	16
17	2.4848	2.6928	2.9170	3.1588	3.4194	3.7000	4.0023	4.3276	17
18	2.6215	2.8543	3.1067	3.3799	3.6758	3.9960	4.3425	4.7171	18
19	2.7656	3.0256	3.3086	3.6165	3.9515	4.3157	4.7116	5.1417	19
20	2.9178	3.2071	3.5236	3.8697	4.2479	4.6610	5.1120	5.6044	20
21	3.0782	3.3996	3.7527	4.1406	4.5664	5.0338	5.5466	6.1088	21
22	3.2475	3.6035	3.9966	4.4304	4.9089	5.4365	6.0180	6.6586	22
23	3.4262	3.8197	4.2564	4.7405	5.2771	5.8715	6.5296	7.2579	23
24	3.6146	4.0489	4.5331	5.0724	5.6729	6.3412	7.0846	7.9111	24
25	3.8134	4.2919	4.8277	5.4274	6.0983	6.8485	7.6868	8.6231	25
26	4.0231	4.5494	5.1415	5.8074	6.5557	7.3964	8.3401	9.3992	26
27	4.2444	4.8223	5.4757	6.2139	7.0474	7.9881	9.0490	10.2451	27
28	4.4778	5.1117	5.8316	6.6488	7.5759	8.6271	9.8182	11.1671	28
29	4.7241	5.4184	6.2107	7.1143	8.1441	9.3173	10.6528	12.1722	29
30	4.9840	5.7435	6.6144	7.6123	8.7550	10.0627	11.5583	13.2677	30

	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	
31	5.2581	6.0881	7.0443	8.1451	9.4116	10.8677	12.5407	14.4618	31
32	5.5473	6.4534	7.5022	8.7153	10.1174	11.7371	13.6067	15.7633	32
33	5.8524	6.8406	7.9898	9.3253	10.8763	12.6760	14.7632	17.1820	33
34	6.1742	7.2510	8.5092	9.9781	11.6920	13.6901	16.0181	18.7284	34
35	6.5138	7.6861	9.0623	10.6766	12.5689	14.7853	17.3796	20.4140	35
36	6.8721	8.1473	9.6513	11.4239	13.5115	15.9682	18.8569	22.2512	36
37	7.2501	8.6361	10.2786	12.2236	14.5249	17.2456	20.4597	24.2538	37
38	7.6488	9.1543	10.9467	13.0793	15.6143	18.6253	22.1988	26.4367	38
39	8.0695	9.7035	11.6583	13.9948	16.7853	20.1153	24.0857	28.8160	39
40	8.5133	10.2857	12.4161	14.9745	18.0442	21.7245	26.1330	31.4094	40
41	8.9815	10.9029	13.2231	16.0227	19.3976	23.4625	28.3543	34.2363	41
42	9.4755	11.5570	14.0826	17.1443	20.8524	25.3395	30.7644	37.3175	42
43	9.9967	12.2505	14.9980	18.3444	22.4163	27.3666	33.3794	40.6761	43
44	10.5465	12.9855	15.9729	19.6285	24.0975	29.5560	36.2167	44.3370	44
45	11.1266	13.7646	17.0111	21.0025	25.9048	31.9204	39.2951	48.3273	45
46	11.7385	14.5905	18.1168	22.4726	27.8477	34.4741	42.6352	52.6767	46
47	12.3841	15.4659	19.2944	24.0457	29.9363	37.2320	46.2592	57.4176	47
48	13.0653	16.3939	20.5485	25.7289	32.1815	40.2106	50.1912	62.5852	48
49	13.7838	17.3775	21.8842	27.5299	34.5951	43.4274	54.4574	68.2179	49
50	14.5420	18.4202	23.3067	29.4570	37.1897	46.9016	59.0863	74.3575	50
51	15.3418	19.5254	24.8216	31.5190	39.9790	50.6537	64.1087	81.0497	51
52	16.1856	20.6969	26.4350	33.7253	42.9774	54.7060	69.5579	88.3442	52
53	17.0758	21.9387	28.1533	36.0861	46.2007	59.0825	75.4703	96.2951	53
54	18.0149	23.2550	29.9833	38.6122	49.6658	63.8091	81.8853	104.9617	54
55	19.0058	24.6503	31.9322	41.3150	53.3907	68.9139	88.8455	114.4083	55
56	20.0511	26.1293	34.0078	44.2071	57.3950	74.4270	96.3974	124.7050	56
57	21.1539	27.6971	36.2183	47.3015	61.6996	80.3811	104.5912	135.9285	57
58	22.3174	29.3589	38.5725	50.6127	66.3271	86.8116	113.4814	148.1620	58
59	23.5448	31.1205	41.0797	54.1555	71.3016	93.7565	123.1274	161.4966	59
60	24.8398	32.9877	43.7498	57.9464	76.6492	101.2571	133.5932	176.0313	60

Part 6.--Amount of 1 where n is 1 to 60 and i is 9.5, 10.0, 10.5, 11.0, 11.5, 12.0, 12.5, and 13.0 percent

	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
1	1.0950	1.1000	1.1050	1.1100	1.1150	1.1200	1.1250	1.1300	1
2	1.1990	1.2100	1.2210	1.2321	1.2432	1.2544	1.2656	1.2769	2
3	1.3129	1.3310	1.3492	1.3676	1.3862	1.4049	1.4238	1.4429	3
4	1.4377	1.4641	1.4909	1.5181	1.5456	1.5735	1.6018	1.6305	4
5	1.5742	1.6105	1.6474	1.6851	1.7234	1.7623	1.8020	1.8424	5
6	1.7238	1.7716	1.8204	1.8704	1.9215	1.9738	2.0273	2.0820	6
7	1.8876	1.9487	2.0116	2.0762	2.1425	2.2107	2.2807	2.3526	7
8	2.0669	2.1436	2.2228	2.3045	2.3889	2.4760	2.5658	2.6584	8
9	2.2632	2.3579	2.4562	2.5580	2.6636	2.7731	2.8865	3.0040	9
10	2.4782	2.5937	2.7141	2.8394	2.9699	3.1058	3.2473	3.3946	10
11	2.7137	2.8531	2.9991	3.1518	3.3115	3.4785	3.6532	3.8359	11
12	2.9715	3.1384	3.3140	3.4985	3.6923	3.8960	4.1099	4.3345	12
13	3.2537	3.4523	3.6619	3.8833	4.1169	4.3635	4.6236	4.8980	13
14	3.5629	3.7975	4.0464	4.3104	4.5904	4.8871	5.2016	5.5348	14
15	3.9013	4.1772	4.4713	4.7846	5.1183	5.4736	5.8518	6.2543	15
16	4.2719	4.5950	4.9408	5.3109	5.7069	6.1304	6.5833	7.0673	16
17	4.6778	5.0545	5.4596	5.8951	6.3632	6.8660	7.4062	7.9861	17
18	5.1222	5.5599	6.0328	6.5436	7.0949	7.6900	8.3319	9.0243	18
19	5.6088	6.1159	6.6663	7.2633	7.9108	8.6128	9.3734	10.1974	19
20	6.1416	6.7275	7.3662	8.0623	8.8206	9.6463	10.5451	11.5231	20
21	6.7251	7.4002	8.1397	8.9492	9.8350	10.8038	11.8632	13.0211	21
22	7.3639	8.1403	8.9944	9.9336	10.9660	12.1003	13.3461	14.7138	22
23	8.0635	8.9543	9.9388	11.0263	12.2271	13.5523	15.0144	16.6266	23
24	8.8296	9.8497	10.9823	12.2392	13.6332	15.1786	16.8912	18.7881	24
25	9.6684	10.8347	12.1355	13.5855	15.2010	17.0001	19.0026	21.2305	25
26	10.5869	11.9182	13.4097	15.0799	16.9491	19.0401	21.3779	23.9905	26
27	11.5926	13.1100	14.8177	16.7386	18.8982	21.3249	24.0502	27.1093	27
28	12.6939	14.4210	16.3736	18.5799	21.0715	23.8839	27.0564	30.6335	28
29	13.8998	15.8631	18.0928	20.6237	23.4948	26.7499	30.4385	34.6158	29
30	15.2203	17.4494	19.9926	22.8923	26.1967	29.9599	34.2433	39.1159	30

	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
31	16.6662	19.1943	22.0918	25.4104	29.2093	33.5551	38.5237	44.2010	31
32	18.2495	21.1138	24.4114	28.2056	32.5683	37.5817	43.3392	49.9471	32
33	19.9832	23.2252	26.9746	31.3082	36.3137	42.0915	48.7566	56.4402	33
34	21.8816	25.5477	29.8069	34.7521	40.4898	47.1425	54.8512	63.7774	34
35	23.9604	28.1024	32.9367	38.5749	45.1461	52.7996	61.7075	72.0685	35
36	26.2366	30.9127	36.3950	42.8181	50.3379	59.1356	69.4210	81.4374	36
37	28.7291	34.0039	40.2165	47.5281	56.1268	66.2318	78.0986	92.0243	37
38	31.4584	37.4043	44.4392	52.7562	62.5814	74.1797	87.8609	103.9874	38
39	34.4469	41.1448	49.1054	58.5593	69.7782	83.0812	98.8436	117.5058	39
40	37.7194	45.2593	54.2614	65.0009	77.8027	93.0510	111.1990	132.7816	40
41	41.3027	49.7852	59.9589	72.1510	86.7500	104.2171	125.0989	150.0432	41
42	45.2265	54.7637	66.2545	80.0876	96.7263	116.7231	140.7362	169.5488	42
43	49.5230	60.2401	73.2113	88.8972	107.8498	130.7299	158.3283	191.5901	43
44	54.2277	66.2641	80.8985	98.6759	120.2525	146.4175	178.1193	216.4968	44
45	59.3793	72.8905	89.3928	109.5302	134.0816	163.9876	200.3842	244.6414	45
46	65.0204	80.1795	98.7790	121.5786	149.5009	183.6661	225.4322	276.4448	46
47	71.1973	88.1975	109.1508	134.9522	166.6935	205.7061	253.6113	312.3826	47
48	77.9611	97.0172	120.6117	149.7970	185.8633	230.3908	285.3127	352.9923	48
49	85.3674	106.7190	133.2759	166.2746	207.2376	258.0377	320.9768	398.8813	49
50	93.4773	117.3909	147.2699	184.5648	231.0699	289.0022	361.0989	450.7359	50
51	102.3576	129.1299	162.7332	204.8670	257.6429	323.6825	406.2362	509.3316	51
52	112.0816	142.0429	179.8202	227.4023	287.2719	362.5243	457.0157	575.5447	52
53	122.7293	156.2472	198.7013	252.4166	320.3081	406.0273	514.1427	650.3655	53
54	134.3886	171.8719	219.5649	280.1824	357.1436	454.7505	578.4106	734.9130	54
55	147.1555	189.0591	242.6193	311.0025	398.2151	509.3206	650.7119	830.4517	55
56	161.1353	207.9651	268.0943	345.2127	444.0098	570.4391	732.0509	938.4104	56
57	176.4431	228.7616	296.2442	383.1861	495.0709	638.8918	823.5572	1060.4038	57
58	193.2052	251.6377	327.3498	425.3366	552.0041	715.5588	926.5019	1198.2563	58
59	211.5597	276.8015	361.7216	472.1236	615.4846	801.4258	1042.3146	1354.0296	59
60	231.6579	304.4816	399.7023	524.0572	686.2653	897.5969	1172.6039	1530.0535	60

Part 7.--Amount of 1 where n is 1 to 60 and i is 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, and 20 percent

	14.0	15.0	16.0	17.0	18.0	19.0	20.0	
1	1.1400	1.1500	1.1600	1.1700	1.1800	1.1900	1.2000	1
2	1.2996	1.3225	1.3456	1.3689	1.3924	1.4161	1.4400	2
3	1.4815	1.5209	1.5609	1.6016	1.6430	1.6852	1.7280	3
4	1.6890	1.7490	1.8106	1.8739	1.9388	2.0053	2.0736	4
5	1.9254	2.0114	2.1003	2.1924	2.2878	2.3864	2.4883	5
6	2.1950	2.3131	2.4364	2.5652	2.6996	2.8398	2.9860	6
7	2.5023	2.6600	2.8262	3.0012	3.1855	3.3793	3.5832	7
8	2.8526	3.0590	3.2784	3.5115	3.7589	4.0214	4.2998	8
9	3.2519	3.5179	3.8030	4.1084	4.4355	4.7854	5.1598	9
10	3.7072	4.0456	4.4114	4.8068	5.2338	5.6947	6.1917	10
11	4.2262	4.6524	5.1173	5.6240	6.1759	6.7767	7.4301	11
12	4.8179	5.3503	5.9360	6.5801	7.2876	8.0642	8.9161	12
13	5.4924	6.1528	6.8858	7.6987	8.5994	9.5964	10.6993	13
14	6.2613	7.0757	7.9875	9.0075	10.1472	11.4198	12.8392	14
15	7.1379	8.1371	9.2655	10.5387	11.9737	13.5895	15.4070	15
16	8.1372	9.3576	10.7480	12.3303	14.1290	16.1715	18.4884	16
17	9.2765	10.7613	12.4677	14.4265	16.6722	19.2441	22.1861	17
18	10.5752	12.3755	14.4625	16.8790	19.6733	22.9005	26.6233	18
19	12.0557	14.2318	16.7765	19.7484	23.2144	27.2516	31.9480	19
20	13.7435	16.3665	19.4608	23.1056	27.3930	32.4294	38.3376	20
21	15.6676	18.8215	22.5745	27.0336	32.3238	38.5910	46.0051	21
22	17.8610	21.6447	26.1864	31.6293	38.1421	45.9233	55.2061	22
23	20.3616	24.8915	30.3762	37.0062	45.0076	54.6487	66.2474	23
24	23.2122	28.6252	35.2364	43.2973	53.1090	65.0320	79.4968	24
25	26.4619	32.9190	40.8742	50.6578	62.6686	77.3881	95.3962	25
26	30.1666	37.8568	47.4141	59.2697	73.9490	92.0918	114.4755	26
27	34.3899	43.5353	55.0004	69.3455	87.2598	109.5893	137.3706	27
28	39.2045	50.0656	63.8004	81.1342	102.9666	130.4112	164.8447	28
29	44.6931	57.5755	74.0085	94.9271	121.5005	155.1893	197.8136	29
30	50.9502	66.2118	85.8499	111.0647	143.3706	184.6753	237.3763	30

	14.0	15.0	16.0	17.0	18.0	19.0	20.0	
31	58.0832	76.1435	99.5859	129.9456	169.1774	219.7636	284.8516	31
32	66.2148	87.5651	115.5196	152.0364	199.6293	261.5187	341.8219	32
33	75.4849	100.6998	134.0027	177.8826	235.5625	311.2073	410.1863	33
34	86.0528	115.8048	155.4432	208.1226	277.9638	370.3366	492.2235	34
35	98.1002	133.1755	180.3141	243.5035	327.9973	440.7006	590.6682	35
36	111.8342	153.1519	209.1643	284.8991	387.0368	524.4337	708.8019	36
37	127.4910	176.1246	242.6306	333.3319	456.7034	624.0761	850.5622	37
38	145.3397	202.5433	281.4515	389.9983	538.9100	742.6506	1020.6747	38
39	165.6873	232.9248	326.4838	456.2980	635.9139	883.7542	1224.8096	39
40	188.8835	267.8635	378.7212	533.8687	750.3783	1051.6675	1469.7716	40
41	215.3272	308.0431	439.3165	624.6264	885.4464	1251.4843	1763.7259	41
42	245.4730	354.2495	509.6072	730.8129	1044.8268	1489.2664	2116.4711	42
43	279.8392	407.3870	591.1443	855.0511	1232.8956	1772.2270	2539.7653	43
44	319.0167	468.4950	685.7274	1000.4098	1454.8168	2108.9501	3047.7183	44
45	363.6791	538.7693	795.4438	1170.4794	1716.6839	2509.6506	3657.2620	45
46	414.5941	619.5847	922.7148	1369.4609	2025.6870	2986.4842	4388.7144	46
47	472.6373	712.5224	1070.3492	1602.2693	2390.3106	3553.9162	5266.4573	47
48	538.8065	819.4007	1241.6051	1874.6550	2820.5665	4229.1603	6319.7487	48
49	614.2395	942.3108	1440.2619	2193.3464	3328.2685	5032.7008	7583.6985	49
50	700.2330	1083.6574	1670.7038	2566.2153	3927.3569	5988.9139	9100.4382	50
51	798.2656	1246.2061	1938.0164	3002.4719	4634.2811	7126.8075	10920.5258	51
52	910.0228	1433.1370	2248.0990	3512.8921	5468.4517	8480.9010	13104.6309	52
53	1037.4260	1648.1075	2607.7949	4110.0838	6452.7730	10092.2722	15725.5571	53
54	1182.6656	1895.3236	3025.0421	4808.7980	7614.2721	12009.8039	18870.6685	54
55	1348.2388	2179.6222	3509.0488	5626.2937	8984.8411	14291.6666	22644.8023	55
56	1536.9922	2506.5655	4070.4966	6582.7636	10602.1125	17007.0833	27173.7627	56
57	1752.1712	2882.5503	4721.7761	7701.8334	12510.4928	20238.4291	32608.5153	57
58	1997.4751	3314.9329	5477.2602	9011.1451	14762.3815	24083.7306	39130.2183	58
59	2277.1216	3812.1728	6353.6219	10543.0397	17419.6101	28659.6394	46956.2620	59
60	2595.9187	4383.9987	7370.2014	12335.3565	20555.1400	34104.9709	56347.5144	60

Appendix table 2: Present value of 1--The $\left[(1+i)^{-n}\right]$ table

Part 1.--The present value of 1 when n is 1 to 60 and i is 5/12, 5.5/12, .5, 6.5/12, 7/12, 7.25/12, 7.5/12, 7.75/12, and 2/3 percent

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.25/12	2/3	
1	.9959	.9954	.9950	.9946	.9942	.9940	.9938	.9936	.9934	1
2	.9917	.9909	.9901	.9893	.9884	.9880	.9876	.9872	.9868	2
3	.9876	.9864	.9851	.9839	.9827	.9821	.9815	.9809	.9803	3
4	.9835	.9819	.9802	.9786	.9770	.9762	.9754	.9746	.9738	4
5	.9794	.9774	.9754	.9734	.9713	.9703	.9693	.9683	.9673	5
6	.9754	.9729	.9705	.9681	.9657	.9645	.9633	.9621	.9609	6
7	.9713	.9685	.9657	.9629	.9601	.9587	.9573	.9559	.9546	7
8	.9673	.9641	.9609	.9577	.9545	.9530	.9514	.9498	.9482	8
9	.9633	.9597	.9561	.9525	.9490	.9472	.9455	.9437	.9420	9
10	.9593	.9553	.9513	.9474	.9435	.9415	.9396	.9377	.9357	10
11	.9553	.9509	.9466	.9423	.9380	.9359	.9338	.9316	.9295	11
12	.9513	.9466	.9419	.9372	.9326	.9303	.9280	.9257	.9234	12
13	.9474	.9423	.9372	.9322	.9272	.9247	.9222	.9197	.9172	13
14	.9434	.9380	.9326	.9272	.9218	.9191	.9165	.9138	.9112	14
15	.9395	.9337	.9279	.9222	.9165	.9136	.9108	.9080	.9051	15
16	.9356	.9294	.9233	.9172	.9111	.9081	.9051	.9021	.8991	16
17	.9318	.9252	.9187	.9123	.9059	.9027	.8995	.8963	.8932	17
18	.9279	.9210	.9141	.9073	.9006	.8972	.8939	.8906	.8873	18
19	.9240	.9168	.9096	.9025	.8954	.8919	.8884	.8849	.8814	19
20	.9202	.9126	.9051	.8976	.8902	.8865	.8828	.8792	.8756	20
21	.9164	.9084	.9006	.8928	.8850	.8812	.8774	.8736	.8698	21
22	.9126	.9043	.8961	.8879	.8799	.8759	.8719	.8679	.8640	22
23	.9088	.9002	.8916	.8832	.8748	.8706	.8665	.8624	.8583	23
24	.9050	.8961	.8872	.8784	.8697	.8654	.8611	.8568	.8526	24
25	.9013	.8920	.8828	.8737	.8647	.8602	.8558	.8513	.8470	25
26	.8975	.8879	.8784	.8690	.8597	.8550	.8504	.8459	.8413	26
27	.8938	.8839	.8740	.8643	.8547	.8499	.8452	.8405	.8358	27
28	.8901	.8798	.8697	.8596	.8497	.8448	.8399	.8351	.8302	28
29	.8864	.8758	.8653	.8550	.8448	.8397	.8347	.8297	.8247	29
30	.8827	.8718	.8610	.8504	.8399	.8347	.8295	.8244	.8193	30

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.25/12	2/3	
31	.8791	.8678	.8567	.8458	.8350	.8297	.8244	.8191	.8138	31
32	.8754	.8639	.8525	.8413	.8302	.8247	.8192	.8138	.8085	32
33	.8718	.8599	.8482	.8367	.8254	.8197	.8142	.8086	.8031	33
34	.8682	.8560	.8440	.8322	.8206	.8148	.8091	.8034	.7978	34
35	.8646	.8521	.8398	.8277	.8158	.8099	.8041	.7983	.7925	35
36	.8610	.8482	.8356	.8233	.8111	.8051	.7991	.7931	.7873	36
37	.8574	.8443	.8315	.8188	.8064	.8002	.7941	.7881	.7820	37
38	.8538	.8405	.8274	.8144	.8017	.7954	.7892	.7830	.7769	38
39	.8503	.8367	.8232	.8100	.7970	.7906	.7843	.7780	.7717	39
40	.8468	.8328	.8191	.8057	.7924	.7859	.7794	.7730	.7666	40
41	.8433	.8290	.8151	.8013	.7878	.7812	.7746	.7680	.7615	41
42	.8398	.8253	.8110	.7970	.7833	.7765	.7698	.7631	.7565	42
43	.8363	.8215	.8070	.7927	.7787	.7718	.7650	.7582	.7515	43
44	.8328	.8177	.8030	.7884	.7742	.7672	.7602	.7533	.7465	44
45	.8294	.8140	.7990	.7842	.7697	.7626	.7555	.7485	.7416	45
46	.8259	.8103	.7950	.7800	.7652	.7580	.7508	.7437	.7366	46
47	.8225	.8066	.7910	.7758	.7608	.7534	.7461	.7389	.7318	47
48	.8191	.8029	.7871	.7716	.7564	.7489	.7415	.7342	.7269	48
49	.8157	.7993	.7832	.7674	7520	.7444	.7369	.7295	.7221	49
50	.8123	.7956	.7793	.7633	7477	.7399	.7323	.7248	.7173	50
51	.8089	.7920	.7754	.7592	.7433	.7355	.7278	.7201	.7126	51
52	.8056	.7884	.7716	.7551	.7390	.7311	.7233	.7155	.7079	52
53	.8022	.7848	.7677	.7510	.7347	.7267	.7188	.7109	.7032	53
54	.7989	.7812	.7639	.7470	.7305	.7223	.7143	.7064	.6985	54
55	.7956	.7776	.7601	.7430	.7262	.7180	.7099	.7018	.6939	55
56	.7923	.7741	.7563	.7390	.7220	.7137	.7055	.6973	.6893	56
57	.7890	.7705	.7525	.7350	.7178	.7094	.7011	.6929	.6847	57
58	.7857	.7670	.7488	.7310	.7137	.7051	.6967	.6884	.6802	58
59	.7825	.7635	.7451	.7271	.7095	.7009	.6924	.6840	.6757	59
60	.7792	.7600	.7414	.7232	.7054	.6967	.6881	.6796	.6712	60

Part 2.--The present value of 1 when n is 1 to 60 and i is 8.25/12, 8.5/12, 8.75/12, .75, 9.25/12, 9.5/12, 9.75/12, 5/6, and 10.25/12 percent

	8.25/12	8.5/12	8.75/12	.75	9.25/12	9.5/12	9.75/12	5/6	10.25/12	
1	.9932	.9930	.9928	.9926	.9924	.9921	.9919	.9917	.9915	1
2	.9864	.9860	.9856	.9852	.9848	.9844	.9839	.9835	.9831	2
3	.9797	.9790	.9784	.9778	.9772	.9766	.9760	.9754	.9748	3
4	.9730	.9722	.9714	.9706	.9698	.9690	.9681	.9673	.9666	4
5	.9663	.9653	.9643	.9633	.9623	.9613	.9603	.9594	.9584	5
6	.9597	.9585	.9573	.9562	.9550	.9538	.9526	.9514	.9502	6
7	.9532	.9518	.9504	.9490	.9477	.9463	.9449	.9436	.9422	7
8	.9467	.9451	.9435	.9420	.9404	.9389	.9373	.9358	.9342	8
9	.9402	.9385	.9367	.9350	.9332	.9315	.9298	.9280	.9263	9
10	.9338	.9318	.9299	.9280	.9261	.9242	.9223	.9204	.9185	10
11	.9274	.9253	.9232	.9211	.9190	.9169	.9148	.9128	.9107	11
12	.9211	.9188	.9165	.9142	.9120	.9097	.9075	.9052	.9030	12
13	.9148	.9123	.9099	.9074	.9050	.9026	.9001	.8977	.8953	13
14	.9085	.9059	.9033	.9007	.8981	.8955	.8929	.8903	.8877	14
15	.9023	.8995	.8967	.8940	.8912	.8884	.8857	.8830	.8802	15
16	.8962	.8932	.8903	.8873	.8844	.8815	.8786	.8757	.8728	16
17	.8901	.8869	.8838	.8807	.8776	.8745	.8715	.8684	.8654	17
18	.8840	.8807	.8774	.8742	.8709	.8677	.8645	.8612	.8580	18
19	.8779	.8745	.8711	.8676	.8642	.8609	.8575	.8541	.8508	19
20	.8719	.8683	.8648	.8612	.8576	.8541	.8506	.8471	.8436	20
21	.8660	.8622	.8585	.8548	.8511	.8474	.8437	.8401	.8364	21
22	.8601	.8562	.8523	.8484	.8446	.8407	.8369	.8331	.8293	22
23	.8542	.8502	.8461	.8421	.8381	.8341	.8302	.8262	.8223	23
24	.8484	.8442	.8400	.8358	.8317	.8276	.8235	.8194	.8154	24
25	.8426	.8382	.8339	.8296	.8253	.8211	.8168	.8126	.8085	25
26	.8368	.8323	.8279	.8234	.8190	.8146	.8103	.8059	.8016	26
27	.8311	.8265	.8219	.8173	.8128	.8082	.8037	.7993	.7948	27
28	.8254	.8207	.8159	.8112	.8065	.8019	.7973	.7927	.7881	28
29	.8198	.8149	.8100	.8052	.8004	.7956	.7908	.7861	.7814	29
30	.8142	.8092	.8042	.7992	.7942	.7893	.7845	.7796	.7748	30

	8.25/12	8.5/12	8.75/12	.75	9.25/12	9.5/12	9.75/12	5/6	10.25/12	
31	.8086	.8035	.7983	.7932	.7882	.7831	.7781	.7732	.7682	31
32	.8031	.7978	.7926	.7873	.7821	.7770	.7719	.7668	.7617	32
33	.7976	.7922	.7868	.7815	.7762	.7709	.7656	.7604	.7553	33
34	.7922	.7866	.7811	.7757	.7702	.7648	.7595	.7542	.7489	34
35	.7868	.7811	.7755	.7699	.7643	.7588	.7533	.7479	.7425	35
36	.7814	.7756	.7699	.7641	.7585	.7529	.7473	.7417	.7362	36
37	.7761	.7702	.7643	.7585	.7527	.7469	.7413	.7356	.7300	37
38	.7708	.7647	.7588	.7528	.7469	.7411	.7353	.7295	.7238	38
39	.7655	.7594	.7533	.7472	.7412	.7353	.7294	.7235	.7177	39
40	.7603	.7540	.7478	.7416	.7355	.7295	.7235	.7175	.7116	40
41	.7551	.7487	.7424	.7361	.7299	.7238	.7176	.7116	.7056	41
42	.7499	.7435	.7370	.7306	.7243	.7181	.7119	.7057	.6996	42
43	.7448	.7382	.7317	.7252	.7188	.7124	.7061	.6999	.6937	43
44	.7397	.7330	.7264	.7198	.7133	.7068	.7004	.6941	.6878	44
45	.7347	.7279	.7211	.7145	.7078	.7013	.6948	.6884	.6820	45
46	.7297	.7228	.7159	.7091	.7024	.6958	.6892	.6827	.6762	46
47	.7247	.7177	.7107	.7039	.6970	.6903	.6836	.6770	.6705	47
48	.7197	.7126	.7056	.6986	.6917	.6849	.6781	.6714	.6648	48
49	.7148	.7076	.7005	.6934	.6864	.6795	.6727	.6659	.6592	49
50	.7099	.7026	.6954	.6883	.6812	.6742	.6672	.6604	.6536	50
51	.7051	.6977	.6904	.6831	.6760	.6689	.6619	.6549	.6481	51
52	.7003	.6928	.6854	.6780	.6708	.6636	.6565	.6495	.6426	52
53	.6955	.6879	.6804	.6730	.6657	.6584	.6512	.6441	.6371	53
54	.6907	.6831	.6755	.6680	.6606	.6532	.6460	.6388	.6317	54
55	.6860	.6783	.6706	.6630	.6555	.6481	.6408	.6335	.6264	55
56	.6813	.6735	.6657	.6581	.6505	.6430	.6356	.6283	.6211	56
57	.6767	.6688	.6609	.6532	.6455	.6380	.6305	.6231	.6158	57
58	.6721	.6641	.6561	.6483	.6406	.6330	.6254	.6180	.6106	58
59	.6675	.6594	.6514	.6435	.6357	.6280	.6204	.6129	.6054	59
60	.6629	.6547	.6467	.6387	.6308	.6230	.6154	.6078	.6003	60

Part 3.--The present value of 1 when n is 1 to 60 and i is 10.5/12, 10.75/12, 11/12, 11.25/12, 11.5/12, 11.75/12, 1.0, 1.25, and 1.5 percent

	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	1.0	1.25	1.5	
1	.9913	.9911	.9909	.9907	.9905	.9903	.9901	.9877	.9852	1
2	.9827	.9823	.9819	.9815	.9811	.9807	.9803	.9755	.9707	2
3	.9742	.9736	.9730	.9724	.9718	.9712	.9706	.9634	.9563	3
4	.9658	.9650	.9642	.9634	.9626	.9618	.9610	.9515	.9422	4
5	.9574	.9564	.9554	.9544	.9534	.9524	.9515	.9398	.9283	5
6	.9491	.9479	.9467	.9456	.9444	.9432	.9420	.9282	.9145	6
7	.9408	.9395	.9381	.9368	.9354	.9341	.9327	.9167	.9010	7
8	.9327	.9311	.9296	.9281	.9265	.9250	.9235	.9054	.8877	8
9	.9246	.9229	.9212	.9194	.9177	.9160	.9143	.8942	.8746	9
10	.9166	.9147	.9128	.9109	.9090	.9072	.9053	.8832	.8617	10
11	.9086	.9066	.9045	.9024	.9004	.8984	.8963	.8723	.8489	11
12	.9007	.8985	.8963	.8941	.8919	.8896	.8874	.8615	.8364	12
13	.8929	.8905	.8881	.8858	.8834	.8810	.8787	.8509	.8240	13
14	.8852	.8826	.8801	.8775	.8750	.8725	.8700	.8404	.8118	14
15	.8775	.8748	.8721	.8694	.8667	.8640	.8613	.8300	.7999	15
16	.8699	.8670	.8642	.8613	.8585	.8556	.8528	.8197	.7880	16
17	.8623	.8593	.8563	.8533	.8503	.8473	.8444	.8096	.7764	17
18	.8549	.8517	.8485	.8454	.8422	.8391	.8360	.7996	.7649	18
19	.8474	.8441	.8408	.8375	.8343	.8310	.8277	.7898	.7536	19
20	.8401	.8366	.8332	.8298	.8263	.8229	.8195	.7800	.7425	20
21	.8328	.8292	.8256	.8220	.8185	.8150	.8114	.7704	.7315	21
22	.8256	.8218	.8181	.8144	.8107	.8071	.8034	.7609	.7207	22
23	.8184	.8145	.8107	.8068	.8030	.7992	.7954	.7515	.7100	23
24	.8113	.8073	.8033	.7994	.7954	.7915	.7876	.7422	.6995	24
25	.8043	.8001	.7960	.7919	.7879	.7838	.7798	.7330	.6892	25
26	.7973	.7930	.7888	.7846	.7804	.7762	.7720	.7240	.6790	26
27	.7904	.7860	.7816	.7773	.7730	.7687	.7644	.7150	.6690	27
28	.7835	.7790	.7745	.7701	.7656	.7612	.7568	.7062	.6591	28
29	.7767	.7721	.7675	.7629	.7584	.7538	.7493	.6975	.6494	29
30	.7700	.7652	.7605	.7558	.7512	.7465	.7419	.6889	.6398	30

	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	1.0	1.25	1.5	
31	.7633	.7585	.7536	.7488	.7440	.7393	.7346	.6804	.6303	31
32	.7567	.7517	.7468	.7419	.7370	.7321	.7273	.6720	.6210	32
33	.7501	.7450	.7400	.7350	.7300	.7250	.7201	.6637	.6118	33
34	.7436	.7384	.7333	.7281	.7230	.7180	.7130	.6555	.6028	34
35	.7372	.7319	.7266	.7214	.7162	.7110	.7059	.6474	.5939	35
36	.7308	.7254	.7200	.7147	.7094	.7041	.6989	.6394	.5851	36
37	.7245	.7189	.7135	.7080	.7027	.6973	.6920	.6315	.5764	37
38	.7182	.7126	.7070	.7015	.6960	.6905	.6852	.6237	.5679	38
39	.7119	.7062	.7006	.6949	.6894	.6838	.6784	.6160	.5595	39
40	.7058	.7000	.6942	.6885	.6828	.6772	.6717	.6084	.5513	40
41	.6996	.6937	.6879	.6821	.6763	.6707	.6650	.6009	.5431	41
42	.6936	.6876	.6816	.6758	.6699	.6641	.6584	.5935	.5351	42
43	.6876	.6815	.6755	.6695	.6636	.6577	.6519	.5862	.5272	43
44	.6816	.6754	.6693	.6633	.6573	.6513	.6454	.5789	.5194	44
45	.6757	.6694	.6632	.6571	.6510	.6450	.6391	.5718	.5117	45
46	.6698	.6635	.6572	.6510	.6449	.6388	.6327	.5647	.5042	46
47	.6640	.6576	.6512	.6450	.6387	.6326	.6265	.5577	.4967	47
48	.6582	.6518	.6453	.6390	.6327	.6264	.6203	.5509	.4894	48
49	.6525	.6460	.6395	.6330	.6267	.6204	.6141	.5441	.4821	49
50	.6469	.6402	.6337	.6272	.6207	.6143	.6080	.5373	.4750	50
51	.6413	.6345	.6279	.6213	.6148	.6084	.6020	.5307	.4680	51
52	.6357	.6289	.6222	.6156	.6090	.6025	.5961	.5242	.4611	52
53	.6302	.6233	.6165	.6098	.6032	.5966	.5902	.5177	.4543	53
54	.6247	.6178	.6109	.6042	.5975	.5909	.5843	.5113	.4475	54
55	.6193	.6123	.6054	.5986	.5918	.5851	.5785	.5050	.4409	55
56	.6139	.6069	.5999	.5930	.5862	.5795	.5728	.4987	.4344	56
57	.6086	.6015	.5944	.5875	.5806	.5738	.5671	.4926	.4280	57
58	.6033	.5961	.5890	.5820	.5751	.5683	.5615	.4865	.4217	58
59	.5981	.5909	.5837	.5766	.5697	.5628	.5560	.4805	.4154	59
60	.5929	.5856	.5784	.5713	.5642	.5573	.5504	.4746	.4093	60

Part 4.--The present value of 1 when n is 1 to 60 and i is 1.75, 2.0, 2.25, 2.5, 2.75, 3.0, 4.0, 4.5, and 5.0

	1.75	2.0	2.25	2.5	2.75	3.0	4.0	4.5	5.0	
1	.9828	.9804	.9780	.9756	.9732	.9709	.9615	.9569	.9524	1
2	.9659	.9612	.9565	.9518	.9472	.9426	.9246	.9157	.9070	2
3	.9493	.9423	.9354	.9286	.9218	.9151	.8890	.8763	.8638	3
4	.9330	.9238	.9148	.9060	.8972	.8885	.8548	.8386	.8227	4
5	.9169	.9057	.8947	.8839	.8732	.8626	.8219	.8025	.7835	5
6	.9011	.8880	.8750	.8623	.8498	.8375	.7903	.7679	.7462	6
7	.8856	.8706	.8558	.8413	.8270	.8131	.7599	.7348	.7107	7
8	.8704	.8535	.8369	.8207	.8049	.7894	.7307	.7032	.6768	8
9	.8554	.8368	.8185	.8007	.7834	.7664	.7026	.6729	.6446	9
10	.8407	.8203	.8005	.7812	.7624	.7441	.6756	.6439	.6139	10
11	.8263	.8043	.7829	.7621	.7420	.7224	.6496	.6162	.5847	11
12	.8121	.7885	.7657	.7436	.7221	.7014	.6246	.5897	.5568	12
13	.7981	.7730	.7488	.7254	.7028	.6810	.6006	.5643	.5303	13
14	.7844	.7579	.7323	.7077	.6840	.6611	.5775	.5400	.5051	14
15	.7709	.7430	.7162	.6905	.6657	.6419	.5553	.5167	.4810	15
16	.7576	.7284	.7005	.6736	.6479	.6232	.5339	.4945	.4581	16
17	.7446	.7142	.6851	.6572	.6305	.6050	.5134	.4732	.4363	17
18	.7318	.7002	.6700	.6412	.6137	.5874	.4936	.4528	.4155	18
19	.7192	.6864	.6552	.6255	.5972	.5703	.4746	.4333	.3957	19
20	.7068	.6730	.6408	.6103	.5813	.5537	.4564	.4146	.3769	20
21	.6947	.6598	.6267	.5954	.5657	.5375	.4388	.3968	.3589	21
22	.6827	.6468	.6129	.5809	.5506	.5219	.4220	.3797	.3418	22
23	.6710	.6342	.5994	.5667	.5358	.5067	.4057	.3634	.3256	23
24	.6594	.6217	.5862	.5529	.5215	.4919	.3901	.3477	.3101	24
25	.6481	.6095	.5733	.5394	.5075	.4776	.3751	.3327	.2953	25
26	.6369	.5976	.5607	.5262	.4939	.4637	.3607	.3184	.2812	26
27	.6260	.5859	.5484	.5134	.4807	.4502	.3468	.3047	.2678	27
28	.6152	.5744	.5363	.5009	.4679	.4371	.3335	.2916	.2551	28
29	.6046	.5631	.5245	.4887	.4553	.4243	.3207	.2790	.2429	29
30	.5942	.5521	.5130	.4767	.4431	.4120	.3083	.2670	.2314	30

	1.75	2.0	2.25	2.5	2.75	3.0	4.0	4.5	5.0	
31	.5840	.5412	.5017	.4651	.4313	.4000	.2965	.2555	.2204	31
32	.5740	.5306	.4907	.4538	.4197	.3883	.2851	.2445	.2099	32
33	.5641	.5202	.4799	.4427	.4085	.3770	.2741	.2340	.1999	33
34	.5544	.5100	.4693	.4319	.3976	.3660	.2636	.2239	.1904	34
35	.5449	.5000	.4590	.4214	.3869	.3554	.2534	.2143	.1813	35
36	.5355	.4902	.4489	.4111	.3766	.3450	.2437	.2050	.1727	36
37	.5263	.4806	.4390	.4011	.3665	.3350	.2343	.1962	.1644	37
38	.5172	.4712	.4293	.3913	.3567	.3252	.2253	.1878	.1566	38
39	.5083	.4619	.4199	.3817	.3471	.3158	.2166	.1797	.1491	39
40	.4996	.4529	.4106	.3724	.3379	.3066	.2083	.1719	.1420	40
41	.4910	.4440	.4016	.3633	.3288	.2976	.2003	.1645	.1353	41
42	.4826	.4353	.3928	.3545	.3200	.2890	.1926	.1574	.1288	42
43	.4743	.4268	.3841	.3458	.3114	.2805	.1852	.1507	.1227	43
44	.4661	.4184	.3757	.3374	.3031	.2724	.1780	.1442	.1169	44
45	.4581	.4102	.3674	.3292	.2950	.2644	.1712	.1380	.1113	45
46	.4502	.4022	.3593	.3211	.2871	.2567	.1646	.1320	.1060	46
47	.4425	.3943	.3514	.3133	.2794	.2493	.1583	.1263	.1009	47
48	.4349	.3865	.3437	.3057	.2719	.2420	.1522	.1209	.0961	48
49	.4274	.3790	.3361	.2982	.2647	.2350	.1463	.1157	.0916	49
50	.4200	.3715	.3287	.2909	.2576	.2281	.1407	.1107	.0872	50
51	.4128	.3642	.3215	.2838	.2507	.2215	.1353	.1059	.0831	51
52	.4057	.3571	.3144	.2769	.2440	.2150	.1301	.1014	.0791	52
53	.3987	.3501	.3075	.2702	.2374	.2088	.1251	.0970	.0753	53
54	.3919	.3432	.3007	.2636	.2311	.2027	.1203	.0928	.0717	54
55	.3851	.3365	.2941	.2572	.2249	.1968	.1157	.0888	.0683	55
56	.3785	.3299	.2876	.2509	.2189	.1910	.1112	.0850	.0651	56
57	.3720	.3234	.2813	.2448	.2130	.1855	.1069	.0814	.0620	57
58	.3656	.3171	.2751	.2388	.2073	.1801	.1028	.0778	.0590	58
59	.3593	.3109	.2691	.2330	.2018	.1748	.0989	.0745	.0562	59
60	.3531	.3048	.2631	.2273	.1964	.1697	.0951	.0713	.0535	60

Part 5.--The present value of 1 when n is 1 to 60 and i is 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, and 9.5 percent

	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	
1	.9479	.9434	.9390	.9346	.9302	.9259	.9217	.9174	.9132	1
2	.8985	.8900	.8817	.8734	.8653	.8573	.8495	.8417	.8340	2
3	.8516	.8396	.8278	.8163	.8050	.7938	.7829	.7722	.7617	3
4	.8072	.7921	.7773	.7629	.7488	.7350	.7216	.7084	.6956	4
5	.7651	.7473	.7299	.7130	.6966	.6806	.6650	.6499	.6352	5
6	.7252	.7050	.6853	.6663	.6480	.6302	.6129	.5963	.5801	6
7	.6874	.6651	.6435	.6227	.6028	.5835	.5649	.5470	.5298	7
8	.6516	.6274	.6042	.5820	.5607	.5403	.5207	.5019	.4838	8
9	.6176	.5919	.5674	.5439	.5216	.5002	.4799	.4604	.4418	9
10	.5854	.5584	.5327	.5083	.4852	.4632	.4423	.4224	.4035	10
11	.5549	.5268	.5002	.4751	.4513	.4289	.4076	.3875	.3685	11
12	.5260	.4970	.4697	.4440	.4199	.3971	.3757	.3555	.3365	12
13	.4986	.4688	.4410	.4150	.3906	.3677	.3463	.3262	.3073	13
14	.4726	.4423	.4141	.3878	.3633	.3405	.3191	.2992	.2807	14
15	.4479	.4173	.3888	.3624	.3380	.3152	.2941	.2745	.2563	15
16	.4246	.3936	.3651	.3387	.3144	.2919	.2711	.2519	.2341	16
17	.4024	.3714	.3428	.3166	.2925	.2703	.2499	.2311	.2138	17
18	.3815	.3503	.3219	.2959	.2720	.2502	.2303	.2120	.1952	18
19	.3616	.3305	.3022	.2765	.2531	.2317	.2122	.1945	.1783	19
20	.3427	.3118	.2838	.2584	.2354	.2145	.1956	.1784	.1628	20
21	.3249	.2942	.2665	.2415	.2190	.1987	.1803	.1637	.1487	21
22	.3079	.2775	.2502	.2257	.2037	.1839	.1662	.1502	.1358	22
23	.2919	.2618	.2349	.2109	.1895	.1703	.1531	.1378	.1240	23
24	.2767	.2470	.2206	.1971	.1763	.1577	.1412	.1264	.1133	24
25	.2622	.2330	.2071	.1842	.1640	.1460	.1301	.1160	.1034	25
26	.2486	.2198	.1945	.1722	.1525	.1352	.1199	.1064	.0945	26
27	.2356	.2074	.1826	.1609	.1419	.1252	.1105	.0976	.0863	27
28	.2233	.1956	.1715	.1504	.1320	.1159	.1019	.0895	.0788	28
29	.2117	.1846	.1610	.1406	.1228	.1073	.0939	.0822	.0719	29
30	.2006	.1741	.1512	.1314	.1142	.0994	.0865	.0754	.0657	30

	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	
31	.1902	.1643	.1420	.1228	.1063	.0920	.0797	.0691	.0600	31
32	.1803	.1550	.1333	.1147	.0988	.0852	.0735	.0634	.0548	32
33	.1709	.1462	.1252	.1072	.0919	.0789	.0677	.0582	.0500	33
34	.1620	.1379	.1175	.1002	.0855	.0730	.0624	.0534	.0457	34
35	.1535	.1301	.1103	.0937	.0796	.0676	.0575	.0490	.0417	35
36	.1455	.1227	.1036	.0875	.0740	.0626	.0530	.0449	.0381	36
37	.1379	.1158	.0973	.0818	.0688	.0580	.0489	.0412	.0348	37
38	.1307	.1092	.0914	.0765	.0640	.0537	.0450	.0378	.0318	38
39	.1239	.1031	.0858	.0715	.0596	.0497	.0415	.0347	.0290	39
40	.1175	.0972	.0805	.0668	.0554	.0460	.0383	.0318	.0265	40
41	.1113	.0917	.0756	.0624	.0516	.0426	.0353	.0292	.0242	41
42	.1055	.0865	.0710	.0583	.0480	.0395	.0325	.0268	.0221	42
43	.1000	.0816	.0667	.0545	.0446	.0365	.0300	.0246	.0202	43
44	.0948	.0770	.0626	.0509	.0415	.0338	.0276	.0226	.0184	44
45	.0899	.0727	.0588	.0476	.0386	.0313	.0254	.0207	.0168	45
46	.0852	.0685	.0552	.0445	.0359	.0290	.0235	.0190	.0154	46
47	.0807	.0647	.0518	.0416	.0334	.0269	.0216	.0174	.0140	47
48	.0765	.0610	.0487	.0389	.0311	.0249	.0199	.0160	.0128	48
49	.0725	.0575	.0457	.0363	.0289	.0230	.0184	.0147	.0117	49
50	.0688	.0543	.0429	.0339	.0269	.0213	.0169	.0134	.0107	50
51	.0652	.0512	.0403	.0317	.0250	.0197	.0156	.0123	.0098	51
52	.0618	.0483	.0378	.0297	.0233	.0183	.0144	.0113	.0089	52
53	.0586	.0456	.0355	.0277	.0216	.0169	.0133	.0104	.0081	53
54	.0555	.0430	.0334	.0259	.0201	.0157	.0122	.0095	.0074	54
55	.0526	.0406	.0313	.0242	.0187	.0145	.0113	.0087	.0068	55
56	.0499	.0383	.0294	.0226	.0174	.0134	.0104	.0080	.0062	56
57	.0473	.0361	.0276	.0211	.0162	.0124	.0096	.0074	.0057	57
58	.0448	.0341	.0259	.0198	.0151	.0115	.0088	.0067	.0052	58
59	.0425	.0321	.0243	.0185	.0140	.0107	.0081	.0062	.0047	59
60	.0403	.0303	.0229	.0173	.0130	.0099	.0075	.0057	.0043	60

Part 6.--The present value of 1 when n is 1 to 60 and i is 10.0, 10.5, 11.0, 11.5, 12.0, 12.5, 13.0, and 14 percent

	10.0	10.5	11.0	11.5	12.0	12.5	13.0	14.0	
1	.9091	.9050	.9009	.896861	.892857	.888889	.884956	.877193	1
2	.8264	.8190	.8116	.804360	.797194	.790123	.783147	.769468	2
3	.7513	.7412	.7312	.721399	.711780	.702332	.693050	.674972	3
4	.6830	.6707	.6587	.646994	.635518	.624295	.613319	.592080	4
5	.6209	.6070	.5935	.580264	.567427	.554929	.542760	.519369	5
6	.5645	.5493	.5346	.520416	.506631	.493270	.480319	.455587	6
7	.5132	.4971	.4817	.466741	.452349	.438462	.425061	.399637	7
8	.4665	.4499	.4339	.418602	.403883	.389744	.376160	.350559	8
9	.4241	.4071	.3909	.375428	.360610	.346439	.332885	.307508	9
10	.3855	.3684	.3522	.336706	.321973	.307946	.294588	.269744	10
11	.3505	.3334	.3173	.301979	.287476	.273730	.260698	.236617	11
12	.3186	.3018	.2858	.270833	.256675	.243315	.230706	.207559	12
13	.2897	.2731	.2575	.242900	.229174	.216280	.204165	.182069	13
14	.2633	.2471	.2320	.217847	.204620	.192249	.180677	.159710	14
15	.2394	.2236	.2090	.195379	.182696	.170888	.159891	.140096	15
16	.2176	.2024	.1883	.175227	.163122	.151901	.141496	.122892	16
17	.1978	.1832	.1696	.157155	.145644	.135023	.125218	.107800	17
18	.1799	.1658	.1528	.140946	.130040	.120020	.110812	.094561	18
19	.1635	.1500	.1377	.126409	.116107	.106685	.098064	.082948	19
20	.1486	.1358	.1240	.113371	.103667	.094831	.086782	.072762	20
21	.1351	.1229	.1117	.101678	.092560	.084294	.076798	.063826	21
22	.1228	.1112	.1007	.091191	.082643	.074928	.067963	.055988	22
23	.1117	.1006	.0907	.081786	.073788	.066603	.060144	.049112	23
24	.1015	.0911	.0817	.073351	.065882	.059202	.053225	.043081	24
25	.0923	.0824	.0736	.065785	.058823	.052624	.047102	.037790	25
26	.0839	.0746	.0663	.059000	.052521	.046777	.041683	.033149	26
27	.0763	.0675	.0597	.052915	.046894	.041580	.036888	.029078	27
28	.0693	.0611	.0538	.047457	.041869	.036960	.032644	.025507	28
29	.0630	.0553	.0485	.042563	.037383	.032853	.028889	.022375	29
30	.0573	.0500	.0437	.038173	.033378	.029203	.025565	.019627	30

	10.0	10.5	11.0	11.5	12.0	12.5	13.0	14.0	
31	.0521	.0453	.0394	.034236	.029802	.025958	.022624	.017217	31
32	.0474	.0410	.0355	.030705	.026609	.023074	.020021	.015102	32
33	.0431	.0371	.0319	.027538	.023758	.020510	.017718	.013248	33
34	.0391	.0335	.0288	.024698	.021212	.018231	.015680	.011621	34
35	.0356	.0304	.0259	.022150	.018940	.016205	.013876	.010194	35
36	.0323	.0275	.0234	.019866	.016910	.014405	.012279	.008942	36
37	.0294	.0249	.0210	.017817	.015098	.012804	.010867	.007844	37
38	.0267	.0225	.0190	.015979	.013481	.011382	.009617	.006880	38
39	.0243	.0204	.0171	.014331	.012036	.010117	.008510	.006035	39
40	.0221	.0184	.0154	.012853	.010747	.008993	.007531	.005294	40
41	.0201	.0167	.0139	.011527	.009595	.007994	.006665	.004644	41
42	.0183	.0151	.0125	.010338	.008567	.007105	.005898	.004074	42
43	.0166	.0137	.0112	.009272	.007649	.006316	.005219	.003573	43
44	.0151	.0124	.0101	.008316	.006830	.005614	.004619	.003135	44
45	.0137	.0112	.0091	.007458	.006098	.004990	.004088	.002750	45
46	.0125	.0101	.0082	.006689	.005445	.004436	.003617	.002412	46
47	.0113	.0092	.0074	.005999	.004861	.003943	.003201	.002116	47
48	.0103	.0083	.0067	.005380	.004340	.003505	.002833	.001856	48
49	.0094	.0075	.0060	.004825	.003875	.003115	.002507	.001628	49
50	.0085	.0068	.0054	.004328	.003460	.002769	.002219	.001428	50
51	.0077	.0061	.0049	.003881	.003089	.002462	.001963	.001253	51
52	.0070	.0056	.0044	.003481	.002758	.002188	.001737	.001099	52
53	.0064	.0050	.0040	.003122	.002463	.001945	.001538	.000964	53
54	.0058	.0046	.0036	.002800	.002199	.001729	.001361	.000846	54
55	.0053	.0041	.0032	.002511	.001963	.001537	.001204	.000742	55
56	.0048	.0037	.0029	.002252	.001753	.001366	.001066	.000651	56
57	.0044	.0034	.0026	.002020	.001565	.001214	.000943	.000571	57
58	.0040	.0031	.0024	.001812	.001398	.001079	.000835	.000501	58
59	.0036	.0028	.0021	.001625	.001248	.000959	.000739	.000439	59
60	.0033	.0025	.0019	.001457	.001114	.000853	.000654	.000385	60

Part 7.--The present value of 1 when n is 1 to 60 and i is 15.0, 16.0, 17.0, 18.0, 19.0, and 20.0

	15.0	16.0	17.0	18.0	19.0	20.0	
1	.869565	.862069	.854701	.847458	.840336	.833333	1
2	.756144	.743163	.730514	.718184	.706165	.694444	2
3	.657516	.640658	.624371	.608631	.593416	.578704	3
4	.571753	.552291	.533650	.515789	.498669	.482253	4
5	.497177	.476113	.456111	.437109	.419049	.401878	5
6	.432328	.410442	.389839	.370432	.352142	.334898	6
7	.375937	53830	.333195	.313925	.295918	.279082	7
8	.326902	.[illegible]5025	.284782	.266038	.248671	.232568	8
9	.284262	.2[illegible]953	.243404	.225456	.208967	.193807	9
10	.247185	.226684	.208037	.191064	.175602	.161506	10
11	.214943	.195417	.177810	.161919	.147565	.134588	11
12	.186907	.168463	.151974	.137220	.124004	.112157	12
13	.162528	.145227	.129[illegible]	.116288	.104205	.093464	13
14	.141329	.125195	.111019	.098549	.087567	.077887	14
15	.122894	.107927	.094888	.083516	.073586	.064905	15
16	.106865	.093041	.081101	.070776	.061837	.054088	16
17	.092926	.080207	.069317	.059980	.051964	.045073	17
18	.080805	.069144	.059245	.050830	.043667	.037561	18
19	.070265	.059607	.050637	.043077	.036695	.031301	19
20	.061100	.051385	.043280	.036506	.030836	.026084	20
21	.053131	.044298	.036991	.030937	.025913	.021737	21
22	.046201	.038188	.031616	.026218	.021775	.018114	22
23	.040174	.032920	.027022	.022218	.018299	.015095	23
24	.034934	.028380	.023096	.018829	.015377	.012579	24
25	.030378	.024465	.019740	.015957	.012922	.010483	25
26	.026415	.021091	.016872	.013523	.010859	.008735	26
27	.022970	.018182	.014421	.011460	.009125	.007280	27
28	.019974	.015674	.012325	.009712	.007668	.006066	28
29	.017369	.013512	.010534	.008230	.006444	.005055	29
30	.015103	.011648	.009004	.006975	.005415	.004213	30

	15.0	16.0	17.0	18.0	19.0	20.0	
31	.013133	.010042	.007696	.005911	.004550	.003511	31
32	.011420	.008657	.006577	.005009	.003824	.002926	32
33	.009931	.007463	.005622	.004245	.003213	.002438	33
34	.008635	.006433	.004805	.003598	.002700	.002032	34
35	.007509	.005546	.004107	.003049	.002269	.001693	35
36	.006529	.004781	.003510	.002584	.001907	.001411	36
37	.005678	.004121	.003000	.002190	.001602	.001176	37
38	.004937	.003553	.002564	.001856	.001347	.000980	38
39	.004293	.003063	.002192	.001573	.001132	.000816	39
40	.003733	.002640	.001873	.001333	.000951	.000680	40
41	.003246	.002276	.001601	.001129	.000799	.000567	41
42	.002823	.001962	.001368	.000957	.000671	.000472	42
43	.002455	.001692	.001170	.000811	.000564	.000394	43
44	.002134	.001458	.001000	.000687	.000474	.000328	44
45	.001856	.001257	.000854	.000583	.000398	.000273	45
46	.001614	.001084	.000730	.000494	.000335	.000228	46
47	.001403	.000934	.000624	.000418	.000281	.000190	47
48	.001220	.000805	.000533	.000355	.000236	.000158	48
49	.001061	.000694	.000456	.000300	.000199	.000132	49
50	.000923	.000599	.000390	.000255	.000167	.000110	50
51	.000802	.000516	.000333	.000216	.000140	.000092	51
52	.000698	.000445	.000285	.000183	.000118	.000076	52
53	.000607	.000383	.000243	.000155	.000099	.000064	53
54	.000528	.000331	.000208	.000131	.000083	.000053	54
55	.000459	.000285	.000178	.000111	.000070	.000044	55
56	.000399	.000246	.000152	.000094	.000059	.000037	56
57	.000347	.000212	.000130	.000080	.000049	.000031	57
58	.000302	.000183	.000111	.000068	.000042	.000026	58
59	.000262	.000157	.000095	.000057	.000035	.000021	59
60	.000228	.000136	.000081	.000049	.000029	.000018	60

Appendix table 3: Present value of an annuity of 1 per period--The PVUS table $P = 1\left[\frac{1-(1+i)^{-n}}{i}\right]$

Part 1.--Present value of 1 where n is 1 to 60 and i is 5/12, 5.5/12, .5, 6.5/12, 7/12, 7.25/12, 7.5/12, and 7.75/12 percent

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.75/12	
1	.9959	.9954	.9950	.9946	.9942	.9940	.9938	.9936	1
2	1.9876	1.9863	1.9851	1.9839	1.9826	1.9820	1.9814	1.9808	2
3	2.9752	2.9727	2.9702	2.9678	2.9653	2.9641	2.9629	2.9617	3
4	3.9587	3.9546	3.9505	3.9464	3.9423	3.9403	3.9383	3.9362	4
5	4.9381	4.9320	4.9259	4.9198	4.9137	4.9106	4.9076	4.9046	5
6	5.9135	5.9049	5.8964	5.8879	5.8794	5.8751	5.8709	5.8667	6
7	6.8848	6.8734	6.8621	6.8508	6.8395	6.8339	6.8282	6.8226	7
8	7.8521	7.8375	7.8230	7.8085	7.7940	7.7868	7.7796	7.7724	8
9	8.8153	8.7972	8.7791	8.7610	8.7430	8.7340	8.7251	8.7161	9
10	9.7746	9.7525	9.7304	9.7084	9.6865	9.6756	9.6647	9.6538	10
11	10.7299	10.7034	10.6770	10.6507	10.6245	10.6115	10.5984	10.5854	11
12	11.6812	11.6500	11.6189	11.5880	11.5571	11.5417	11.5264	11.5111	12
13	12.6286	12.5923	12.5562	12.5201	12.4843	12.4664	12.4486	12.4308	13
14	13.5721	13.5303	13.4887	13.4473	13.4061	13.3856	13.3651	13.3446	14
15	14.5116	14.4640	14.4166	14.3695	14.3225	14.2992	14.2758	14.2526	15
16	15.4472	15.3934	15.3399	15.2867	15.2337	15.2073	15.1810	15.1547	16
17	16.3790	16.3186	16.2586	16.1989	16.1395	16.1100	16.0804	16.0510	17
18	17.3069	17.2396	17.1728	17.1063	17.0401	17.0072	16.9744	16.9416	18
19	18.2309	18.1564	18.0824	18.0087	17.9355	17.8991	17.8627	17.8265	19
20	19.1511	19.0690	18.9874	18.9063	18.8257	18.7856	18.7456	18.7057	20
21	20.0675	19.9775	19.8880	19.7991	19.7107	19.6667	19.6229	19.5792	21
22	20.9801	20.8817	20.7841	20.6870	20.5906	20.5426	20.4948	20.4472	22
23	21.8889	21.7819	21.6757	21.5702	21.4654	21.4133	21.3613	21.3095	23
24	22.7939	22.6780	22.5629	22.4486	22.3351	22.2787	22.2224	22.1664	24
25	23.6952	23.5699	23.4456	23.3222	23.1998	23.1389	23.0782	23.0177	25
26	24.5927	24.4578	24.3240	24.1912	24.0594	23.9939	23.9286	23.8636	26
27	25.4865	25.3417	25.1980	25.0555	24.9141	24.8438	24.7738	24.7041	27
28	26.3766	26.2215	26.0677	25.9151	25.7638	25.6886	25.6137	25.5391	28
29	27.2630	27.0973	26.9330	26.7701	26.6086	26.5283	26.4484	26.3688	29
30	28.1457	27.9691	27.7941	27.6205	27.4485	27.3630	27.2779	27.1932	30

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.75/12	
31	29.0248	28.8370	28.6508	28.4663	28.2835	28.1927	28.1023	28.0123	31
32	29.9002	29.7008	29.5033	29.3076	29.1137	29.0174	28.9215	28.8261	32
33	30.7720	30.5608	30.3515	30.1443	29.9390	29.8371	29.7357	29.6347	33
34	31.6402	31.4168	31.1955	30.9765	30.7596	30.6519	30.5448	30.4381	34
35	32.5047	32.2689	32.0354	31.8042	31.5754	31.4619	31.3488	31.2364	35
36	33.3657	33.1171	32.8710	32.6275	32.3865	32.2669	32.1479	32.0296	36
37	34.2231	33.9614	33.7025	33.4463	33.1928	33.0671	32.9420	32.8176	37
38	35.0770	34.8019	34.5299	34.2607	33.9945	33.8625	33.7312	33.6006	38
39	35.9273	35.6386	35.3531	35.0708	34.7916	34.6532	34.5155	34.3786	39
40	36.7740	36.4714	36.1722	35.8764	35.5840	35.4390	35.2949	35.1516	40
41	37.6173	37.3004	36.9873	36.6778	36.3718	36.2202	36.0695	35.9196	41
42	38.4571	38.1257	37.7983	37.4748	37.1551	36.9967	36.8392	36.6827	42
43	39.2933	38.9472	38.6053	38.2675	37.9338	37.7685	37.6042	37.4409	43
44	40.1261	39.7649	39.4082	39.0559	38.7080	38.5357	38.3644	38.1942	44
45	40.9555	40.5790	40.2072	39.8401	39.4777	39.2986	39.1199	38.9427	45
46	41.7814	41.3893	41.0022	40.6201	40.2430	40.0563	39.8707	39.6864	46
47	42.6039	42.1959	41.7932	41.3959	41.0038	40.8097	40.6169	40.4253	47
48	43.4230	42.9988	42.5803	42.1675	41.7602	41.5586	41.3584	41.1595	48
49	44.2386	43.7980	43.3635	42.9349	42.5122	42.3030	42.0953	41.8889	49
50	45.0509	44.5936	44.1428	43.6982	43.2599	43.0430	42.8276	42.6137	50
51	45.8598	45.3856	44.9182	44.4574	44.0032	43.7785	43.5554	43.3339	51
52	46.6654	46.1740	45.6897	45.2125	44.7422	44.5096	44.2786	44.0494	52
53	47.4676	46.9588	46.4575	45.9635	45.4769	45.2363	44.9974	44.7603	53
54	48.2665	47.7400	47.2214	46.7105	46.2074	45.9586	45.7117	45.4667	54
55	49.0621	48.5176	47.9814	47.4535	46.9336	46.6766	46.4216	46.1685	55
56	49.8544	49.2917	48.7378	48.1924	47.6556	47.3903	47.1270	46.8658	56
57	50.6433	50.0622	49.4903	48.9274	48.3734	48.0997	47.8281	47.5587	57
58	51.4290	50.8293	50.2391	49.6584	49.0871	48.8048	48.5248	48.2471	58
59	52.2115	51.5928	50.9842	50.3855	49.7966	49.5057	49.2172	48.9311	59
60	52.9907	52.3528	51.7256	51.1087	50.5020	50.2024	49.9053	49.6107	60

Part 2.--Present value of 1 where n is 1 to 60 and i is 2/3, 8.25/12, 8.5/12, 8.75/12, .75, 9.25/12, 9.5/12, and 9.75/12 percent

	2/3	8.25/12	8.5/12	8.75/12	.75	9.25/12	9.5/12	9.75/12	
1	.9934	.9932	.9930	.9928	.9926	.9924	.9921	.9919	1
2	1.9802	1.9796	1.9789	1.9783	1.9777	1.9771	1.9765	1.9759	2
3	2.9604	2.9592	2.9580	2.9568	2.9556	2.9543	2.9531	2.9519	3
4	3.9342	3.9322	3.9302	3.9281	3.9261	3.9241	3.9221	3.9201	4
5	4.9015	4.8985	4.8955	4.8925	4.8894	4.8864	4.8834	4.8804	5
6	5.8625	5.8582	5.8540	5.8498	5.8456	5.8414	5.8372	5.8330	6
7	6.8170	6.8114	6.8058	6.8002	6.7946	6.7891	6.7835	6.7779	7
8	7.7652	7.7581	7.7509	7.7438	7.7366	7.7295	7.7224	7.7152	8
9	8.7072	8.6983	8.6894	8.6805	8.6716	8.6627	8.6539	8.6450	9
10	9.6429	9.6320	9.6212	9.6104	9.5996	9.5888	9.5780	9.5673	10
11	10.5724	10.5594	10.5465	10.5336	10.5207	10.5078	10.4949	10.4821	11
12	11.4958	11.4805	11.4653	11.4501	11.4349	11.4198	11.4047	11.3896	12
13	12.4130	12.3953	12.3776	12.3600	12.3423	12.3248	12.3072	12.2897	13
14	13.3242	13.3038	13.2835	13.2633	13.2430	13.2228	13.2027	13.1826	14
15	14.2293	14.2062	14.1831	14.1600	14.1370	14.1140	14.0911	14.0683	15
16	15.1285	15.1023	15.0763	15.0503	15.0243	14.9984	14.9726	14.9469	16
17	16.0217	15.9924	15.9632	15.9341	15.9050	15.8761	15.8472	15.8183	17
18	16.9089	16.8764	16.8439	16.8115	16.7792	16.7470	16.7148	16.6828	18
19	17.7903	17.7543	17.7184	17.6826	17.6468	17.6112	17.5757	17.5403	19
20	18.6659	18.6263	18.5867	18.5473	18.5080	18.4688	18.4298	18.3908	20
21	19.5357	19.4922	19.4490	19.4058	19.3628	19.3199	19.2772	19.2346	21
22	20.3997	20.3523	20.3051	20.2581	20.2112	20.1645	20.1179	20.0715	22
23	21.2579	21.2065	21.1553	21.1042	21.0533	21.0026	20.9520	20.9017	23
24	22.1105	22.0549	21.9995	21.9442	21.8891	21.8343	21.7796	21.7251	24
25	22.9575	22.8975	22.8377	22.7781	22.7188	22.6596	22.6007	22.5420	25
26	23.7988	23.7343	23.6700	23.6060	23.5422	23.4786	23.4153	23.3522	26
27	24.6346	24.5654	24.4965	24.4279	24.3595	24.2914	24.2236	24.1560	27
28	25.4648	25.3909	25.3172	25.2438	25.1707	25.0979	25.0254	24.9532	28
29	26.2896	26.2107	26.1321	26.0538	25.9759	25.8983	25.8210	25.7441	29
30	27.1088	27.0249	26.9412	26.8580	26.7751	26.6925	26.6104	26.5285	30

	2/3	8.25/12	8.5/12	8.75/12	.75	9.25/12	9.5/12	9.75/12	
31	27.9227	27.8335	27.7447	27.6563	27.5683	27.4807	27.3935	27.3067	31
32	28.7312	28.6366	28.5425	28.4489	28.3557	28.2628	28.1705	28.0785	32
33	29.5343	29.4343	29.3348	29.2357	29.1371	29.0390	28.9414	28.8442	33
34	30.3320	30.2265	30.1214	30.0168	29.9128	29.8092	29.7062	29.6036	34
35	31.1246	31.0132	30.9025	30.7923	30.6827	30.5736	30.4650	30.3570	35
36	31.9118	31.7947	31.6781	31.5622	31.4468	31.3320	31.2179	31.1043	36
37	32.6938	32.5707	32.4483	32.3264	32.2053	32.0847	31.9648	31.8455	37
38	33.4707	33.3415	33.2130	33.0852	32.9581	32.8316	32.7059	32.5808	38
39	34.2424	34.1070	33.9724	33.8385	33.7053	33.5728	33.4411	33.3101	39
40	35.0090	34.8673	34.7264	34.5863	34.4469	34.3084	34.1706	34.0336	40
41	35.7706	35.6224	35.4751	35.3287	35.1831	35.0383	34.8944	34.7513	41
42	36.5270	36.3723	36.2186	36.0657	35.9137	35.7626	35.6124	35.4631	42
43	37.2785	37.1172	36.9568	36.7974	36.6389	36.4814	36.3249	36.1693	43
44	38.0250	37.8569	37.6898	37.5238	37.3587	37.1947	37.0317	36.8697	44
45	38.7666	38.5916	38.4177	38.2449	38.0732	37.9025	37.7330	37.5645	45
46	39.5032	39.3213	39.1404	38.9608	38.7823	38.6050	38.4288	38.2537	46
47	40.2350	40.0459	39.8581	39.6715	39.4862	39.3020	39.1191	38.9373	47
48	40.9619	40.7657	40.5707	40.3771	40.1848	39.9937	39.8039	39.6154	48
49	41.6840	41.4805	41.2784	41.0776	40.8782	40.6802	40.4835	40.2881	49
50	42.4013	42.1904	41.9810	41.7730	41.5664	41.3613	41.1576	40.9553	50
51	43.1139	42.8955	42.6787	42.4634	42.2496	42.0373	41.8265	41.6172	51
52	43.8218	43.5958	43.3715	43.1487	42.9276	42.7081	42.4901	42.2737	52
53	44.5249	44.2913	44.0594	43.8292	43.6006	43.3737	43.1485	42.9249	53
54	45.2235	44.9821	44.7425	44.5046	44.2686	44.0343	43.8018	43.5709	54
55	45.9173	45.6681	45.4207	45.1752	44.9316	44.6898	44.4499	44.2117	55
56	46.6066	46.3494	46.0942	45.8410	45.5897	45.3403	45.0929	44.8473	56
57	47.2913	47.0261	46.7630	46.5019	46.2429	45.9859	45.7308	45.4778	57
58	47.9715	47.6982	47.4270	47.1580	46.8912	46.6264	46.3638	46.1032	58
59	48.6472	48.3657	48.0864	47.8094	47.5347	47.2621	46.9918	46.7236	59
60	49.3184	49.0286	48.7412	48.4561	48.1734	47.8930	47.6148	47.3390	60

Part 3.--Present value of 1 where n is 1 to 60 and i is 5/6, 10.25/12, 10.5/12, 10.75/12, 11/12, 11.25/12, 11.5/12, and 11.75/12 percent

	5/6	10.25/12	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	
1	.9917	.9915	.9913	.9911	.9909	.9907	.9905	.9903	1
2	1.9753	1.9747	1.9741	1.9734	1.9728	1.9722	1.9716	1.9710	2
3	2.9507	2.9495	2.9483	2.9470	2.9458	2.9446	2.9434	2.9422	3
4	3.9180	3.9160	3.9140	3.9120	3.9100	3.9080	3.9060	3.9040	4
5	4.8774	4.8744	4.8714	4.8684	4.8654	4.8624	4.8594	4.8564	5
6	5.8288	5.8246	5.8205	5.8163	5.8121	5.8079	5.8038	5.7996	6
7	6.7724	6.7668	6.7613	6.7558	6.7502	6.7447	6.7392	6.7337	7
8	7.7081	7.7011	7.6940	7.6869	7.6798	7.6728	7.6657	7.6587	8
9	8.6362	8.6274	8.6186	8.6098	8.6010	8.5922	8.5835	8.5747	9
10	9.5565	9.5458	9.5351	9.5244	9.5138	9.5031	9.4925	9.4819	10
11	10.4693	10.4565	10.4437	10.4310	10.4183	10.4056	10.3929	10.3803	11
12	11.3745	11.3595	11.3445	11.3295	11.3146	11.2997	11.2848	11.2699	12
13	12.2722	12.2548	12.2374	12.2200	12.2027	12.1854	12.1682	12.1509	13
14	13.1626	13.1425	13.1226	13.1027	13.0828	13.0629	13.0432	13.0234	14
15	14.0455	14.0228	14.0001	13.9774	13.9549	13.9323	13.9099	13.8874	15
16	14.9212	14.8955	14.8700	14.8445	14.8190	14.7936	14.7683	14.7431	16
17	15.7896	15.7609	15.7323	15.7038	15.6753	15.6470	15.6186	15.5904	17
18	16.6508	16.6190	16.5872	16.5555	16.5239	16.4923	16.4609	16.4295	18
19	17.5050	17.4697	17.4346	17.3996	17.3647	17.3299	17.2951	17.2605	19
20	18.3520	18.3133	18.2747	18.2362	18.1979	18.1596	18.1215	18.0835	20
21	19.1921	19.1497	19.1075	19.0654	19.0235	18.9817	18.9400	18.8984	21
22	20.0252	19.9791	19.9331	19.8873	19.8416	19.7961	19.7507	19.7055	22
23	20.8514	20.8014	20.7515	20.7018	20.6523	20.6029	20.5537	20.5047	23
24	21.6709	21.6168	21.5629	21.5091	21.4556	21.4023	21.3491	21.2962	24
25	22.4835	22.4252	22.3671	22.3093	22.2516	22.1942	22.1370	22.0800	25
26	23.2894	23.2268	23.1645	23.1023	23.0404	22.9788	22.9174	22.8562	26
27	24.0887	24.0216	23.9549	23.8883	23.8221	23.7561	23.6903	23.6248	27
28	24.8813	24.8097	24.7384	24.6674	24.5966	24.5261	24.4560	24.3861	28
29	25.6674	25.5911	25.5151	25.4395	25.3641	25.2891	25.2143	25.1399	29
30	26.4470	26.3659	26.2851	26.2047	26.1246	26.0449	25.9655	25.8864	30

	5/6	10.25/12	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	
31	27.2202	27.1341	27.0485	26.9632	26.8782	26.7937	26.7095	26.6257	31
32	27.9870	27.8959	27.8052	27.7149	27.6250	27.5355	27.4465	27.3578	32
33	28.7474	28.6511	28.5553	28.4599	28.3650	28.2705	28.1765	28.0829	33
34	29.5016	29.4000	29.2989	29.1984	29.0983	28.9986	28.8995	28.8009	34
35	30.2495	30.1425	30.0361	29.9302	29.8249	29.7200	29.6157	29.5119	35
36	30.9912	30.8788	30.7669	30.6556	30.5449	30.4347	30.3251	30.2160	36
37	31.7268	31.6088	31.4914	31.3745	31.2583	31.1427	31.0277	30.9133	37
38	32.4564	32.3326	32.2095	32.0871	31.9653	31.8442	31.7237	31.6039	38
39	33.1799	33.0503	32.9215	32.7933	32.6659	32.5391	32.4131	32.2877	39
40	33.8974	33.7619	33.6272	33.4933	33.3601	33.2276	33.0959	32.9649	40
41	34.6090	34.4675	34.3269	34.1870	34.0480	33.9097	33.7723	33.6356	41
42	35.3147	35.1671	35.0204	34.8746	34.7296	34.5855	34.4422	34.2997	42
43	36.0146	35.8608	35.7080	35.5561	35.4051	35.2550	35.1058	34.9574	43
44	36.7087	36.5486	36.3896	36.2315	36.0744	35.9182	35.7630	35.6088	44
45	37.3970	37.2306	37.0653	36.9009	36.7376	36.5753	36.4141	36.2538	45
46	38.0797	37.9068	37.7351	37.5644	37.3948	37.2263	37.0589	36.8926	46
47	38.7567	38.5773	38.3991	38.2220	38.0461	37.8713	37.6976	37.5251	47
48	39.4282	39.2421	39.0573	38.8738	38.6914	38.5103	38.3303	38.1516	48
49	40.0940	39.9013	39.7099	39.5197	39.3309	39.1433	38.9570	38.7719	49
50	40.7544	40.5549	40.3568	40.1600	39.9645	39.7705	39.5777	39.3863	50
51	41.4093	41.2030	40.9980	40.7945	40.5924	40.3918	40.1925	39.9946	51
52	42.0589	41.8455	41.6337	41.4234	41.2146	41.0073	40.8015	40.5971	52
53	42.7030	42.4827	42.2639	42.0468	41.8312	41.6172	41.4047	41.1938	53
54	43.3418	43.1144	42.8886	42.6646	42.4421	42.2214	42.0022	41.7846	54
55	43.9754	43.7408	43.5080	43.2769	43.0475	42.8199	42.5940	42.3698	55
56	44.6037	44.3618	44.1219	43.8838	43.6474	43.4129	43.1802	42.9492	56
57	45.2268	44.9777	44.7305	44.4852	44.2419	44.0004	43.7608	43.5230	57
58	45.8447	45.5883	45.3338	45.0814	44.8309	44.5825	44.3359	44.0913	58
59	46.4576	46.1937	45.9319	45.6722	45.4146	45.1591	44.9056	44.6541	59
60	47.0654	46.7940	46.5248	46.2578	45.9930	45.7304	45.4698	45.2114	60

Part 4.--Present value of 1 where n is 1 to 60 and i is 1.0, 1.25, 1.5, 1.75, 2.0, 2.25, 2.5, and 2.75 percent

	1.0	1.25	1.5	1.75	2.0	2.25	2.5	2.75	
1	.9901	.9877	.9852	.9828	.9804	.9780	.9756	.9732	1
2	1.9704	1.9631	1.9559	1.9487	1.9416	1.9345	1.9274	1.9204	2
3	2.9410	2.9265	2.9122	2.8980	2.8839	2.8699	2.8560	2.8423	3
4	3.9020	3.8781	3.8544	3.8309	3.8077	3.7847	3.7620	3.7394	4
5	4.8534	4.8178	4.7826	4.7479	4.7135	4.6795	4.6458	4.6126	5
6	5.7955	5.7460	5.6972	5.6490	5.6014	5.5545	5.5081	5.4624	6
7	6.7282	6.6627	6.5982	6.5346	6.4720	6.4102	6.3494	6.2894	7
8	7.6517	7.5681	7.4859	7.4051	7.3255	7.2472	7.1701	7.0943	8
9	8.5660	8.4623	8.3605	8.2605	8.1622	8.0657	7.9709	7.8777	9
10	9.4713	9.3455	9.2222	9.1012	8.9826	8.8662	8.7521	8.6401	10
11	10.3676	10.2178	10.0711	9.9275	9.7868	9.6491	9.5142	9.3821	11
12	11.2551	11.0793	10.9075	10.7395	10.5753	10.4148	10.2578	10.1042	12
13	12.1337	11.9302	11.7315	11.5376	11.3484	11.1636	10.9832	10.8070	13
14	13.0037	12.7706	12.5434	12.3220	12.1062	11.8959	11.6909	11.4910	14
15	13.8651	13.6005	13.3432	13.0929	12.8493	12.6122	12.3814	12.1567	15
16	14.7179	14.4203	14.1313	13.8505	13.5777	13.3126	13.0550	12.8046	16
17	15.5623	15.2299	14.9076	14.5951	14.2919	13.9977	13.7122	13.4351	17
18	16.3983	16.0295	15.6726	15.3269	14.9920	14.6677	14.3534	14.0488	18
19	17.2260	16.8193	16.4262	16.0461	15.6785	15.3229	14.9789	14.6460	19
20	18.0456	17.5993	17.1686	16.7529	16.3514	15.9637	15.5893	15.2273	20
21	18.8570	18.3697	17.9001	17.4475	17.0112	16.5904	16.1845	15.7929	21
22	19.6604	19.1306	18.6208	18.1303	17.6580	17.2034	16.7654	16.3435	22
23	20.4558	19.8820	19.3309	18.8012	18.2922	17.8028	17.3321	16.8793	23
24	21.2434	20.6242	20.0304	19.4607	18.9139	18.3890	17.8850	17.4008	24
25	22.0232	21.3573	20.7196	20.1088	19.5235	18.9624	18.4244	17.9083	25
26	22.7952	22.0813	21.3986	20.7457	20.1210	19.5231	18.9506	18.4023	26
27	23.5596	22.7963	22.0676	21.3717	20.7069	20.0715	19.4640	18.8830	27
28	24.3164	23.5025	22.7267	21.9870	21.2813	20.6078	19.9649	19.3508	28
29	25.0658	24.2000	23.3761	22.5916	21.8444	21.1323	20.4535	19.8062	29
30	25.8077	24.8889	24.0158	23.1858	22.3965	21.6453	20.9303	20.2493	30

	1.0	1.25	1.5	1.75	2.0	2.25	2.5	2.75	
31	26.5423	25.5693	24.6461	23.7699	22.9377	22.1470	21.3954	20.6806	31
32	27.2696	26.2413	25.2671	24.3439	23.4683	22.6377	21.8492	21.1003	32
33	27.9897	26.9050	25.8790	24.9080	23.9886	23.1175	22.2919	21.5088	33
34	28.7027	27.5605	26.4817	25.4624	24.4986	23.5868	22.7238	21.9064	34
35	29.4086	28.2079	27.0756	26.0073	24.9986	24.0458	23.1452	22.2933	35
36	30.1075	28.8473	27.6607	26.5428	25.4888	24.4947	23.5563	22.6699	36
37	30.7995	29.4788	28.2371	27.0690	25.9695	24.9337	23.9573	23.0364	37
38	31.4847	30.1025	28.8051	27.5863	26.4406	25.3630	24.3486	23.3931	38
39	32.1630	30.7185	29.3646	28.0946	26.9026	25.7829	24.7303	23.7402	39
40	32.8347	31.3269	29.9158	28.5942	27.3555	26.1935	25.1028	24.0781	40
41	33.4997	31.9278	30.4590	29.0852	27.7995	26.5951	25.4661	24.4069	41
42	34.1581	32.5213	30.9941	29.5678	28.2348	26.9879	25.8206	24.7269	42
43	34.8100	33.1075	31.5212	30.0421	28.6616	27.3720	26.1664	25.0384	43
44	35.4555	33.6864	32.0406	30.5082	29.0800	27.7477	26.5038	25.3415	44
45	36.0945	34.2582	32.5523	30.9663	29.4902	28.1151	26.8330	25.6365	45
46	36.7272	34.8229	33.0565	31.4165	29.8923	28.4744	27.1542	25.9236	46
47	37.3537	35.3806	33.5532	31.8589	30.2866	28.8259	27.4675	26.2030	47
48	37.9740	35.9315	34.0426	32.2938	30.6731	29.1695	27.7732	26.4749	48
49	38.5881	36.4755	34.5247	32.7212	31.0521	29.5057	28.0714	26.7396	49
50	39.1961	37.0129	34.9997	33.1412	31.4236	29.8344	28.3623	26.9972	50
51	39.7981	37.5436	35.4677	33.5540	31.7878	30.1559	28.6462	27.2479	51
52	40.3942	38.0677	35.9287	33.9597	32.1449	30.4703	28.9231	27.4918	52
53	40.9844	38.5854	36.3830	34.3584	32.4950	30.7778	29.1932	27.7293	53
54	41.5687	39.0967	36.8305	34.7503	32.8383	31.0785	29.4568	27.9604	54
55	42.1472	39.6017	37.2715	35.1354	33.1748	31.3727	29.7140	28.1853	55
56	42.7200	40.1004	37.7059	35.5140	33.5047	31.6603	29.9649	28.4042	56
57	43.2871	40.5930	38.1339	35.8859	33.8281	31.9416	30.2096	28.6172	57
58	43.8486	41.0795	38.5555	36.2515	34.1452	32.2167	30.4484	28.8245	58
59	44.4046	41.5600	38.9710	36.6109	34.4561	32.4858	30.6814	29.0263	59
60	44.9550	42.0346	39.3803	36.9640	34.7609	32.7490	30.9087	29.2227	60

Part 5.--Present value of 1 where n is 1 to 60 and i is 3.0, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, and 7.0 percent

	3.0	4.0	4.5	5.0	5.5	6.0	6.5	7.0	
1	.9709	.9615	.9569	.9524	.9479	.9434	.9390	.9346	1
2	1.9135	1.8861	1.8727	1.8594	1.8463	1.8334	1.8206	1.8080	2
3	2.8286	2.7751	2.7490	2.7232	2.6979	2.6730	2.6485	2.6243	3
4	3.7171	3.6299	3.5875	3.5460	3.5052	3.4651	3.4258	3.3872	4
5	4.5797	4.4518	4.3900	4.3295	4.2703	4.2124	4.1557	4.1002	5
6	5.4172	5.2421	5.1579	5.0757	4.9955	4.9173	4.8410	4.7665	6
7	6.2303	6.0021	5.8927	5.7864	5.6830	5.5824	5.4845	5.3893	7
8	7.0197	6.7327	6.5959	6.4632	6.3346	6.2098	6.0888	5.9713	8
9	7.7861	7.4353	7.2688	7.1078	6.9522	6.8017	6.6561	6.5152	9
10	8.5302	8.1109	7.9127	7.7217	7.5376	7.3601	7.1888	7.0236	10
11	9.2526	8.7605	8.5289	8.3064	8.0925	7.8869	7.6890	7.4987	11
12	9.9540	9.3851	9.1186	8.8633	8.6185	8.3838	8.1587	7.9427	12
13	10.6350	9.9856	9.6829	9.3936	9.1171	8.8527	8.5997	8.3577	13
14	11.2961	10.5631	10.2228	9.8986	9.5896	9.2950	9.0138	8.7455	14
15	11.9379	11.1184	10.7395	10.3797	10.0376	9.7122	9.4027	9.1079	15
16	12.5611	11.6523	11.2340	10.8378	10.4622	10.1059	9.7678	9.4466	16
17	13.1661	12.1657	11.7072	11.2741	10.8646	10.4773	10.1106	9.7632	17
18	13.7535	12.6593	12.1600	11.6896	11.2461	10.8276	10.4325	10.0591	18
19	14.3238	13.1339	12.5933	12.0853	11.6077	11.1581	10.7347	10.3356	19
20	14.8775	13.5903	13.0079	12.4622	11.9504	11.4699	11.0185	10.5940	20
21	15.4150	14.0292	13.4047	12.8212	12.2752	11.7641	11.2850	10.8355	21
22	15.9369	14.4511	13.7844	13.1630	12.5832	12.0416	11.5352	11.0612	22
23	16.4436	14.8568	14.1478	13.4886	12.8750	12.3034	11.7701	11.2722	23
24	16.9355	15.2470	14.4955	13.7986	13.1517	12.5504	11.9907	11.4693	24
25	17.4131	15.6221	14.8282	14.0939	13.4139	12.7834	12.1979	11.6536	25
26	17.8768	15.9828	15.1466	14.3752	13.6625	13.0032	12.3924	11.8258	26
27	18.3270	16.3296	15.4513	14.6430	13.8981	13.2105	12.5750	11.9867	27
28	18.7641	16.6631	15.7429	14.8981	14.1214	13.4062	12.7465	12.1371	28
29	19.1885	16.9837	16.0219	15.1411	14.3331	13.5907	12.9075	12.2777	29
30	19.6004	17.2920	16.2889	15.3725	14.5337	13.7648	13.0587	12.4090	30

	3.0	4.0	4.5	5.0	5.5	6.0	6.5	7.0	
31	20.0004	17.5885	16.5444	15.5928	14.7239	13.9291	13.2006	12.5318	31
32	20.3888	17.8736	16.7889	15.8027	14.9042	14.0840	13.3339	12.6466	32
33	20.7658	18.1476	17.0229	16.0025	15.0751	14.2302	13.4591	12.7538	33
34	21.1318	18.4112	17.2468	16.1929	15.2370	14.3681	13.5766	12.8540	34
35	21.4872	18.6646	17.4610	16.3742	15.3906	14.4982	13.6870	12.9477	35
36	21.8323	18.9083	17.6660	16.5469	15.5361	14.6210	13.7906	13.0352	36
37	22.1672	19.1426	17.8622	16.7113	15.6740	14.7368	13.8879	13.1170	37
38	22.4925	19.3679	18.0500	16.8679	15.8047	14.8460	13.9792	13.1935	38
39	22.8082	19.5845	18.2297	17.0170	15.9287	14.9491	14.0650	13.2649	39
40	23.1148	19.7928	18.4016	17.1591	16.0461	15.0463	14.1455	13.3317	40
41	23.4124	19.9931	18.5661	17.2944	16.1575	15.1380	14.2212	13.3941	41
42	23.7014	20.1856	18.7235	17.4232	16.2630	15.2245	14.2922	13.4524	42
43	23.9819	20.3708	18.8742	17.5459	16.3630	15.3062	14.3588	13.5070	43
44	24.2543	20.5488	19.0184	17.6628	16.4579	15.3832	14.4214	13.5579	44
45	24.5187	20.7200	19.1563	17.7741	16.5477	15.4558	14.4802	13.6055	45
46	24.7754	20.8847	19.2884	17.8801	16.6329	15.5244	14.5354	13.6500	46
47	25.0247	21.0429	19.4147	17.9810	16.7137	15.5890	14.5873	13.6916	47
48	25.2667	21.1951	19.5356	18.0772	16.7902	15.6500	14.6359	13.7305	48
49	25.5017	21.3415	19.6513	18.1687	16.8628	15.7076	14.6816	13.7668	49
50	25.7298	21.4822	19.7620	18.2559	16.9315	15.7619	14.7245	13.8007	50
51	25.9512	21.6175	19.8680	18.3390	16.9967	15.8131	14.7648	13.8325	51
52	26.1662	21.7476	19.9693	18.4181	17.0585	15.8614	14.8026	13.8621	52
53	26.3750	21.8727	20.0663	18.4934	17.1170	15.9070	14.8382	13.8898	53
54	26.5777	21.9930	20.1592	18.5651	17.1726	15.9500	14.8715	13.9157	54
55	26.7744	22.1086	20.2480	18.6335	17.2252	15.9905	14.9028	13.9399	55
56	26.9655	22.2198	20.3330	18.6985	17.2750	16.0288	14.9322	13.9626	56
57	27.1509	22.3267	20.4144	18.7605	17.3223	16.0649	14.9598	13.9837	57
58	27.3310	22.4296	20.4922	18.8195	17.3671	16.0990	14.9858	14.0035	58
59	27.5058	22.5284	20.5667	18.8758	17.4096	16.1311	15.0101	14.0219	59
60	27.6756	22.6235	20.6380	18.9293	17.4499	16.1614	15.0330	14.0392	60

Part 6.--Present value of 1 where n is 1 to 60 and i is 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 10.5, 11.0, and 11.5 percent

	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	
1	.9302	.9259	.9217	.9174	.9132	.9091	.9050	.9009	.8969	1
2	1.7956	1.7833	1.7711	1.7591	1.7473	1.7355	1.7240	1.7125	1.7012	2
3	2.6005	2.5771	2.5540	2.5313	2.5089	2.4869	2.4651	2.4437	2.4226	3
4	3.3493	3.3121	3.2756	3.2397	3.2045	3.1699	3.1359	3.1024	3.0696	4
5	4.0459	3.9927	3.9406	3.8897	3.8397	3.7908	3.7429	3.6959	3.6499	5
6	4.6938	4.6229	4.5536	4.4859	4.4198	4.3553	4.2922	4.2305	4.1703	6
7	5.2966	5.2064	5.1185	5.0330	4.9496	4.8684	4.7893	4.7122	4.6370	7
8	5.8573	5.7466	5.6392	5.5348	5.4334	5.3349	5.2392	5.1461	5.0556	8
9	6.3789	6.2469	6.1191	5.9952	5.8753	5.7590	5.6463	5.5370	5.4311	9
10	6.8641	6.7101	6.5613	6.4177	6.2788	6.1446	6.0148	5.8892	5.7678	10
11	7.3154	7.1390	6.9690	6.8052	6.6473	6.4951	6.3482	6.2065	6.0697	11
12	7.7353	7.5361	7.3447	7.1607	6.9838	6.8137	6.6500	6.4924	6.3406	12
13	8.1258	7.9038	7.6910	7.4869	7.2912	7.1034	6.9230	6.7499	6.5835	13
14	8.4892	8.2442	8.0101	7.7862	7.5719	7.3667	7.1702	6.9819	6.8013	14
15	8.8271	8.5595	8.3042	8.0607	7.8282	7.6061	7.3938	7.1909	6.9967	15
16	9.1415	8.8514	8.5753	8.3126	8.0623	7.8237	7.5962	7.3792	7.1719	16
17	9.4340	9.1216	8.8252	8.5436	8.2760	8.0216	7.7794	7.5488	7.3291	17
18	9.7060	9.3719	9.0555	8.7556	8.4713	8.2014	7.9451	7.7016	7.4700	18
19	9.9591	9.6036	9.2677	8.9501	8.6496	8.3649	8.0952	7.8393	7.5964	19
20	10.1945	9.8181	9.4633	9.1285	8.8124	8.5136	8.2309	7.9633	7.7098	20
21	10.4135	10.0168	9.6436	9.2922	8.9611	8.6487	8.3538	8.0751	7.8115	21
22	10.6172	10.2007	9.8098	9.4424	9.0969	8.7715	8.4649	8.1757	7.9027	22
23	10.8067	10.3711	9.9629	9.5802	9.2209	8.8832	8.5656	8.2664	7.9845	23
24	10.9830	10.5288	10.1041	9.7066	9.3341	8.9847	8.6566	8.3481	8.0578	24
25	11.1469	10.6748	10.2342	9.8226	9.4376	9.0770	8.7390	8.4217	8.1236	25
26	11.2995	10.8100	10.3541	9.9290	9.5320	9.1609	8.8136	8.4881	8.1826	26
27	11.4414	10.9352	10.4646	10.0266	9.6183	9.2372	8.8811	8.5478	8.2355	27
28	11.5734	11.0511	10.5665	10.1161	9.6971	9.3066	8.9422	8.6016	8.2830	28
29	11.6962	11.1584	10.6603	10.1983	9.7690	9.3696	8.9974	8.6501	8.3255	29
30	11.8104	11.2578	10.7468	10.2737	9.8347	9.4269	9.0474	8.6938	8.3637	30

	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	
31	11.9166	11.3498	10.8266	10.3428	9.8947	9.4790	9.0927	8.7331	8.3980	31
32	12.0155	11.4350	10.9001	10.4062	9.9495	9.5264	9.1337	8.7686	8.4287	32
33	12.1074	11.5139	10.9678	10.4644	9.9996	9.5694	9.1707	8.8005	8.4562	33
34	12.1929	11.5869	11.0302	10.5178	10.0453	9.6086	9.2043	8.8293	8.4809	34
35	12.2725	11.6546	11.0878	10.5668	10.0870	9.6442	9.2347	8.8552	8.5030	35
36	12.3465	11.7172	11.1408	10.6118	10.1251	9.6765	9.2621	8.8786	8.5229	36
37	12.4154	11.7752	11.1897	10.6530	10.1599	9.7059	9.2870	8.8996	8.5407	37
38	12.4794	11.8289	11.2347	10.6908	10.1917	9.7327	9.3095	8.9186	8.5567	38
39	12.5390	11.8786	11.2763	10.7255	10.2207	9.7570	9.3299	8.9357	8.5710	39
40	12.5944	11.9246	11.3145	10.7574	10.2472	9.7791	9.3483	8.9511	8.5839	40
41	12.6460	11.9672	11.3498	10.7866	10.2715	9.7991	9.3650	8.9649	8.5954	41
42	12.6939	12.0067	11.3823	10.8134	10.2936	9.8174	9.3801	8.9774	8.6058	42
43	12.7385	12.0432	11.4123	10.8380	10.3138	9.8340	9.3937	8.9886	8.6150	43
44	12.7800	12.0771	11.4399	10.8605	10.3322	9.8491	9.4061	8.9988	8.6233	44
45	12.8186	12.1084	11.4653	10.8812	10.3490	9.8628	9.4173	9.0079	8.6308	45
46	12.8545	12.1374	11.4888	10.9002	10.3644	9.8753	9.4274	9.0161	8.6375	46
47	12.8879	12.1643	11.5104	10.9176	10.3785	9.8866	9.4366	9.0235	8.6435	47
48	12.9190	12.1891	11.5303	10.9336	10.3913	9.8969	9.4448	9.0302	8.6489	48
49	12.9479	12.2122	11.5487	10.9482	10.4030	9.9063	9.4524	9.0362	8.6537	49
50	12.9748	12.2335	11.5656	10.9617	10.4137	9.9148	9.4591	9.0417	8.6580	50
51	12.9998	12.2532	11.5812	10.9740	10.4235	9.9226	9.4653	9.0465	8.6619	51
52	13.0231	12.2715	11.5956	10.9853	10.4324	9.9296	9.4708	9.0509	8.6654	52
53	13.0447	12.2884	11.6088	10.9957	10.4405	9.9360	9.4759	9.0549	8.6685	53
54	13.0649	12.3041	11.6210	11.0053	10.4480	9.9418	9.4804	9.0585	8.6713	54
55	13.0836	12.3186	11.6323	11.0140	10.4548	9.9471	9.4846	9.0617	8.6738	55
56	13.1010	12.3321	11.6427	11.0220	10.4610	9.9519	9.4883	9.0646	8.6761	56
57	13.1172	12.3445	11.6522	11.0294	10.4667	9.9563	9.4917	9.0672	8.6781	57
58	13.1323	12.3560	11.6610	11.0361	10.4718	9.9603	9.4947	9.0695	8.6799	58
59	13.1463	12.3667	11.6692	11.0423	10.4766	9.9639	9.4975	9.0717	8.6815	59
60	13.1594	12.3766	11.6766	11.0480	10.4809	9.9672	9.5000	9.0736	8.6830	60

Part 7.--Present value of 1 where n is 1 to 60 and i is 12.0, 12.5, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, and 20.0 percent

	12.0	12.5	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	
1	.8929	.8889	.8850	.8772	.8696	.8621	.8547	.8475	.8403	.8333	1
2	1.6901	1.6790	1.6681	1.6467	1.6257	1.6052	1.5852	1.5656	1.5465	1.5278	2
3	2.4018	2.3813	2.3612	2.3216	2.2832	2.2459	2.2096	2.1743	2.1399	2.1065	3
4	3.0373	3.0056	2.9745	2.9137	2.8550	2.7982	2.7432	2.6901	2.6386	2.5887	4
5	3.6048	3.5606	3.5172	3.4331	3.3522	3.2743	3.1993	3.1272	3.0576	2.9906	5
6	4.1114	4.0538	3.9975	3.8887	3.7845	3.6847	3.5892	3.4976	3.4098	3.3255	6
7	4.5638	4.4923	4.4226	4.2883	4.1604	4.0386	3.9224	3.8115	3.7057	3.6046	7
8	4.9676	4.8820	4.7988	4.6389	4.4873	4.3436	4.2072	4.0776	3.9544	3.8372	8
9	5.3282	5.2285	5.1317	4.9464	4.7716	4.6065	4.4506	4.3030	4.1633	4.0310	9
10	5.6502	5.5364	5.4262	5.2161	5.0188	4.8332	4.6586	4.4941	4.3389	4.1925	10
11	5.9377	5.8102	5.6869	5.4527	5.2337	5.0286	4.8364	4.6560	4.4865	4.3271	11
12	6.1944	6.0535	5.9176	5.6603	5.4206	5.1971	4.9884	4.7932	4.6105	4.4392	12
13	6.4235	6.2698	6.1218	5.8424	5.5831	5.3423	5.1183	4.9095	4.7147	4.5327	13
14	6.6282	6.4620	6.3025	6.0021	5.7245	5.4675	5.2293	5.0081	4.8023	4.6106	14
15	6.8109	6.6329	6.4624	6.1422	5.8474	5.5755	5.3242	5.0916	4.8759	4.6755	15
16	6.9740	6.7848	6.6039	6.2651	5.9542	5.6685	5.4053	5.1624	4.9377	4.7296	16
17	7.1196	6.9198	6.7291	6.3729	6.0472	5.7487	5.4746	5.2223	4.9897	4.7746	17
18	7.2497	7.0398	6.8399	6.4674	6.1280	5.8178	5.5339	5.2732	5.0333	4.8122	18
19	7.3658	7.1465	6.9380	6.5504	6.1982	5.8775	5.5845	5.3162	5.0700	4.8435	19
20	7.4694	7.2414	7.0248	6.6231	6.2593	5.9288	5.6278	5.3527	5.1009	4.8696	20
21	7.5620	7.3256	7.1016	6.6870	6.3125	5.9731	5.6648	5.3837	5.1268	4.8913	21
22	7.6446	7.4006	7.1695	6.7429	6.3587	6.0113	5.6964	5.4099	5.1486	4.9094	22
23	7.7184	7.4672	7.2297	6.7921	6.3988	6.0442	5.7234	5.4321	5.1668	4.9245	23
24	7.7843	7.5264	7.2829	6.8351	6.4338	6.0726	5.7465	5.4509	5.1822	4.9371	24
25	7.8431	7.5790	7.3300	6.8729	6.4641	6.0971	5.7662	5.4669	5.1951	4.9476	25
26	7.8957	7.6258	7.3717	6.9061	6.4906	6.1182	5.7831	5.4804	5.2060	4.9563	26
27	7.9426	7.6674	7.4086	6.9352	6.5135	6.1364	5.7975	5.4919	5.2151	4.9636	27
28	7.9844	7.7043	7.4412	6.9607	6.5335	6.1520	5.8099	5.5016	5.2228	4.9697	28
29	8.0218	7.7372	7.4701	6.9830	6.5509	6.1656	5.8204	5.5098	5.2292	4.9747	29
30	8.0552	7.7664	7.4957	7.0027	6.5660	6.1772	5.8294	5.5168	5.2347	4.9789	30

	12.0	12.5	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	
31	8.0850	7.7923	7.5183	7.0199	6.5791	6.1872	5.8371	5.5227	5.2392	4.9824	31
32	8.1116	7.8154	7.5383	7.0350	6.5905	6.1959	5.8437	5.5277	5.2430	4.9854	32
33	8.1354	7.8359	7.5560	7.0482	6.6005	6.2034	5.8493	5.5320	5.2462	4.9878	33
34	8.1566	7.8542	7.5717	7.0599	6.6091	6.2098	5.8541	5.5356	5.2489	4.9898	34
35	8.1755	7.8704	7.5856	7.0700	6.6166	6.2153	5.8582	5.5386	5.2512	4.9915	35
36	8.1924	7.8848	7.5979	7.0790	6.6231	6.2201	5.8617	5.5412	5.2531	4.9929	36
37	8.2075	7.8976	7.6087	7.0868	6.6288	6.2242	5.8647	5.5434	5.2547	4.9941	37
38	8.2210	7.9089	7.6183	7.0937	6.6338	6.2278	5.8673	5.5452	5.2561	4.9951	38
39	8.2330	7.9191	7.6268	7.0997	6.6380	6.2309	5.8695	5.5468	5.2572	4.9959	39
40	8.2438	7.9281	7.6344	7.1050	6.6418	6.2335	5.8713	5.5482	5.2582	4.9966	40
41	8.2534	7.9361	7.6410	7.1097	6.6450	6.2358	5.8729	5.5493	5.2590	4.9972	41
42	8.2619	7.9432	7.6469	7.1138	6.6478	6.2377	5.8743	5.5502	5.2596	4.9976	42
43	8.2696	7.9495	7.6522	7.1173	6.6503	6.2394	5.8755	5.5510	5.2602	4.9980	43
44	8.2764	7.9551	7.6568	7.1205	6.6524	6.2409	5.8765	5.5517	5.2607	4.9984	44
45	8.2825	7.9601	7.6609	7.1232	6.6543	6.2421	5.8773	5.5523	5.2611	4.9986	45
46	8.2880	7.9645	7.6645	7.1256	6.6559	6.2432	5.8781	5.5528	5.2614	4.9989	46
47	8.2928	7.9685	7.6677	7.1277	6.6573	6.2442	5.8787	5.5532	5.2617	4.9991	47
48	8.2972	7.9720	7.6705	7.1296	6.6585	6.2450	5.8792	5.5536	5.2619	4.9992	48
49	8.3010	7.9751	7.6730	7.1312	6.6596	6.2457	5.8797	5.5539	5.2621	4.9993	49
50	8.3045	7.9778	7.6752	7.1327	6.6605	6.2463	5.8801	5.5541	5.2623	4.9995	50
51	8.3076	7.9803	7.6772	7.1339	6.6613	6.2468	5.8804	5.5544	5.2624	4.9995	51
52	8.3103	7.9825	7.6789	7.1350	6.6620	6.2472	5.8807	5.5545	5.2625	4.9996	52
53	8.3128	7.9844	7.6805	7.1360	6.6626	6.2476	5.8809	5.5547	5.2626	4.9997	53
54	8.3150	7.9862	7.6818	7.1368	6.6631	6.2479	5.8811	5.5548	5.2627	4.9997	54
55	8.3170	7.9877	7.6830	7.1376	6.6636	6.2482	5.8813	5.5549	5.2628	4.9998	55
56	8.3187	7.9891	7.6841	7.1382	6.6640	6.2485	5.8815	5.5550	5.2628	4.9998	56
57	8.3203	7.9903	7.6851	7.1388	6.6644	6.2487	5.8816	5.5551	5.2629	4.9998	57
58	8.3217	7.9914	7.6859	7.1393	6.6647	6.2489	5.8817	5.5552	5.2629	4.9999	58
59	8.3229	7.9923	7.6866	7.1397	6.6649	6.2490	5.8818	5.5552	5.2630	4.9999	59
60	8.3240	7.9932	7.6873	7.1401	6.6651	6.2492	5.8819	5.5553	5.2630	4.9999	60

Appendix table 4: The Amount of Annuity of 1 per period--The FVUS table

$$A = 1 \left[\frac{(1+i)^n - 1}{i} \right]$$

Part 1.--Future value where n is 1 to 60 and i is 5/12, 5.5/12, .5, 6.5/12, 7/12, 7.25/12, 7.5/12, 7.75/12, and 2/3 percent

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.75/12	2/3	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1
2	2.0042	2.0046	2.0050	2.0054	2.0058	2.0060	2.0062	2.0065	2.0067	2
3	3.0125	3.0138	3.0150	3.0163	3.0175	3.0182	3.0188	3.0194	3.0200	3
4	4.0251	4.0276	4.0301	4.0326	4.0351	4.0364	4.0377	4.0389	4.0402	4
5	5.0418	5.0460	5.0503	5.0545	5.0587	5.0608	5.0629	5.0650	5.0671	5
6	6.0628	6.0692	6.0755	6.0818	6.0882	6.0914	6.0945	6.0977	6.1009	6
7	7.0881	7.0970	7.1059	7.1148	7.1237	7.1282	7.1326	7.1371	7.1416	7
8	8.1176	8.1295	8.1414	8.1533	8.1653	8.1712	8.1772	8.1832	8.1892	8
9	9.1515	9.1668	9.1821	9.1975	9.2129	9.2206	9.2283	9.2360	9.2438	9
10	10.1896	10.2088	10.2280	10.2473	10.2666	10.2763	10.2860	10.2957	10.3054	10
11	11.2321	11.2556	11.2792	11.3028	11.3265	11.3384	11.3503	11.3622	11.3741	11
12	12.2789	12.3072	12.3356	12.3640	12.3926	12.4069	12.4212	12.4356	12.4499	12
13	13.3300	13.3636	13.3972	13.4310	13.4649	13.4818	13.4988	13.5159	13.5329	13
14	14.3856	14.4248	14.4642	14.5038	14.5434	14.5633	14.5832	14.6032	14.6231	14
15	15.4455	15.4909	15.5365	15.5823	15.6283	15.6513	15.6744	15.6975	15.7206	15
16	16.5099	16.5619	16.6142	16.6667	16.7194	16.7458	16.7723	16.7989	16.8254	16
17	17.5786	17.6378	17.6973	17.7570	17.8170	17.8470	17.8772	17.9073	17.9376	17
18	18.6519	18.7187	18.7858	18.8532	18.9209	18.9548	18.9889	19.0230	19.0572	18
19	19.7296	19.8045	19.8797	19.9553	20.0313	20.0694	20.1076	20.1459	20.1842	19
20	20.8118	20.8953	20.9791	21.0634	21.1481	21.1906	21.2332	21.2760	21.3188	20
21	21.8985	21.9910	22.0840	22.1775	22.2715	22.3186	22.3659	22.4134	22.4609	21
22	22.9898	23.0918	23.1944	23.2976	23.4014	23.4535	23.5057	23.5581	23.6107	22
23	24.0856	24.1977	24.3104	24.4238	24.5379	24.5952	24.6526	24.7103	24.7681	23
24	25.1859	25.3086	25.4320	25.5561	25.6810	25.7438	25.8067	25.8699	25.9332	24
25	26.2909	26.4246	26.5591	26.6945	26.8308	26.8993	26.9680	27.0369	27.1061	25
26	27.4004	27.5457	27.6919	27.8391	27.9874	28.0618	28.1366	28.2115	28.2868	26
27	28.5146	28.6719	28.8304	28.9899	29.1506	29.2314	29.3124	29.3937	29.4754	27
28	29.6334	29.8033	29.9745	30.1470	30.3207	30.4080	30.4956	30.5836	30.6719	28
29	30.7569	30.9399	31.1244	31.3103	31.4975	31.5917	31.6862	31.7811	31.8763	29
30	31.8850	32.0817	32.2800	32.4799	32.6813	32.7826	32.8843	32.9864	33.0889	30

	5/12	5.5/12	.5	6.5/12	7/12	7.25/12	7.5/12	7.75/12	2/3	
31	33.0179	33.2288	33.4414	33.6558	33.8719	33.9806	34.0898	34.1994	34.3094	31
32	34.1554	34.3811	34.6086	34.8381	35.0695	35.1859	35.3028	35.4203	35.5382	32
33	35.2978	35.5387	35.7817	36.0268	36.2741	36.3985	36.5235	36.6490	36.7751	33
34	36.4448	36.7015	36.9606	37.2219	37.4857	37.6184	37.7518	37.8857	38.0203	34
35	37.5967	37.8698	38.1454	38.4236	38.7043	38.8457	38.9877	39.1304	39.2737	35
36	38.7533	39.0433	39.3361	39.6317	39.9301	40.0804	40.2314	40.3831	40.5356	36
37	39.9148	40.2223	40.5328	40.8464	41.1630	41.3225	41.4828	41.6439	41.8058	37
38	41.0811	41.4066	41.7354	42.0676	42.4031	42.5722	42.7421	42.9129	43.0845	38
39	42.2523	42.5964	42.9441	43.2955	43.6505	43.8294	44.0092	44.1900	44.3717	39
40	43.4283	43.7916	44.1588	44.5300	44.9051	45.0942	45.2843	45.4754	45.6675	40
41	44.6093	44.9924	45.3796	45.7712	46.1671	46.3666	46.5673	46.7691	46.9720	41
42	45.7952	46.1986	46.6065	47.0191	47.4364	47.6468	47.8584	48.0711	48.2851	42
43	46.9860	47.4103	47.8396	48.2738	48.7131	48.9346	49.1575	49.3816	49.6070	43
44	48.1818	48.6276	49.0788	49.5353	49.9972	50.2303	50.4647	50.7005	50.9378	44
45	49.3825	49.8505	50.3242	50.8036	51.2889	51.5338	51.7801	52.0280	52.2773	45
46	50.5883	51.0790	51.5758	52.0788	52.5881	52.8451	53.1037	53.3640	53.6259	46
47	51.7991	52.3131	52.8337	53.3609	53.8948	54.1644	54.4356	54.7086	54.9834	47
48	53.0149	53.5529	54.0978	54.6499	55.2092	55.4916	55.7759	56.0620	56.3499	48
49	54.2358	54.7983	55.3683	55.9459	56.5313	56.8269	57.1245	57.4240	57.7256	49
50	55.4618	56.0495	56.6452	57.2490	57.8611	58.1702	58.4815	58.7949	59.1104	50
51	56.6929	57.3064	57.9284	58.5591	59.1986	59.5217	59.8470	60.1746	60.5045	51
52	57.9291	58.5690	59.2180	59.8763	60.5439	60.8813	61.2210	61.5632	61.9079	52
53	59.1704	59.8375	60.5141	61.2006	61.8971	62.2491	62.6037	62.9608	63.3206	53
54	60.4170	61.1117	61.8167	62.5321	63.2581	63.6252	63.9949	64.3674	64.7427	54
55	61.6687	62.3918	63.1258	63.8708	64.6271	65.0096	65.3949	65.7832	66.1743	55
56	62.9257	63.6778	64.4414	65.2168	66.0041	66.4024	66.8036	67.2080	67.6155	56
57	64.1879	64.9696	65.7636	66.5701	67.3892	67.8035	68.2212	68.6421	69.0663	57
58	65.4553	66.2674	67.0924	67.9306	68.7823	69.2132	69.6475	70.0854	70.5267	58
59	66.7280	67.5711	68.4279	69.2986	70.1835	70.6313	71.0828	71.5380	71.9969	59
60	68.0061	68.8808	69.7700	70.6740	71.5929	72.0581	72.5271	73.0000	73.4769	60

Part 2.--Future value where n is 1 to 60 and i is 8.25/12, 8.5/12, 8.75/12, .75, 9.25/12, 9.5/12, 9.75/12, 5/6, and 10.25/12 percent

	8.25/12	8.5/12	8.75/12	.75	9.25/12	9.5/12	9.75/12	5/6	10.25/12	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1
2	2.0069	2.0071	2.0073	2.0075	2.0077	2.0079	2.0081	2.0083	2.0085	2
3	3.0207	3.0213	3.0219	3.0226	3.0232	3.0238	3.0244	3.0251	3.0257	3
4	4.0414	4.0427	4.0440	4.0452	4.0465	4.0478	4.0490	4.0503	4.0515	4
5	5.0692	5.0713	5.0735	5.0756	5.0777	5.0798	5.0819	5.0840	5.0861	5
6	6.1041	6.1073	6.1104	6.1136	6.1168	6.1200	6.1232	6.1264	6.1296	6
7	7.1460	7.1505	7.1550	7.1595	7.1640	7.1685	7.1730	7.1775	7.1820	7
8	8.1952	8.2012	8.2072	8.2132	8.2192	8.2252	8.2312	8.2373	8.2433	8
9	9.2515	9.2593	9.2670	9.2748	9.2825	9.2903	9.2981	9.3059	9.3137	9
10	10.3151	10.3248	10.3346	10.3443	10.3541	10.3639	10.3737	10.3835	10.3933	10
11	11.3860	11.3980	11.4099	11.4219	11.4339	11.4459	11.4579	11.4700	11.4820	11
12	12.4643	12.4787	12.4931	12.5076	12.5221	12.5365	12.5510	12.5656	12.5801	12
13	13.5500	13.5671	13.5842	13.6014	13.6186	13.6358	13.6530	13.6703	13.6876	13
14	14.6432	14.6632	14.6833	14.7034	14.7236	14.7437	14.7640	14.7842	14.8045	14
15	15.7438	15.7671	15.7904	15.8137	15.8370	15.8605	15.8839	15.9074	15.9309	15
16	16.8521	16.8788	16.9055	16.9323	16.9591	16.9860	17.0130	17.0400	17.0670	16
17	17.9679	17.9983	18.0288	18.0593	18.0899	18.1205	18.1512	18.1820	18.2128	17
18	19.0915	19.1258	19.1602	19.1947	19.2293	19.2639	19.2987	19.3335	19.3684	18
19	20.2227	20.2613	20.2999	20.3387	20.3775	20.4165	20.4555	20.4946	20.5338	19
20	21.3617	21.4048	21.4480	21.4912	21.5346	21.5781	21.6217	21.6654	21.7092	20
21	22.5086	22.5564	22.6043	22.6524	22.7006	22.7489	22.7974	22.8459	22.8946	21
22	23.6634	23.7162	23.7692	23.8223	23.8756	23.9290	23.9826	24.0363	24.0902	22
23	24.8260	24.8842	24.9425	25.0010	25.0596	25.1184	25.1774	25.2366	25.2960	23
24	25.9967	26.0604	26.1244	26.1885	26.2528	26.3173	26.3820	26.4469	26.5120	24
25	27.1754	27.2450	27.3148	27.3849	27.4551	27.5256	27.5964	27.6673	27.7385	25
26	28.3623	28.4380	28.5140	28.5903	28.6668	28.7436	28.8206	28.8979	28.9754	26
27	29.5573	29.6395	29.7219	29.8047	29.8878	29.9711	30.0547	30.1387	30.2229	27
28	30.7605	30.8494	30.9387	31.0282	31.1181	31.2084	31.2989	31.3898	31.4811	28
29	31.9719	32.0679	32.1642	32.2609	32.3580	32.4554	32.5532	32.6514	32.7500	29
30	33.1918	33.2951	33.3988	33.5029	33.6074	33.7124	33.8177	33.9235	34.0297	30

	8.25/12	8.5/12	8.75/12	.75	9.25/12	9.5/12	9.75/12	5/6	10.25/12	
31	34.4199	34.5309	34.6423	34.7542	34.8665	34.9793	35.0925	35.2062	35.3204	31
32	35.6566	35.7755	35.8949	36.0148	36.1353	36.2562	36.3776	36.4996	36.6221	32
33	36.9017	37.0289	37.1566	37.2849	37.4138	37.5432	37.6732	37.8038	37.9349	33
34	38.1554	38.2912	38.4276	38.5646	38.7022	38.8404	38.9793	39.1188	39.2589	34
35	39.4177	39.5624	39.7078	39.8538	40.0005	40.1479	40.2960	40.4448	40.5943	35
36	40.6887	40.8427	40.9973	41.1527	41.3089	41.4658	41.6234	41.7818	41.9410	36
37	41.9685	42.1320	42.2963	42.4614	42.6273	42.7940	42.9616	43.1300	43.2992	37
38	43.2570	43.4304	43.6047	43.7798	43.9559	44.1328	44.3107	44.4894	44.6691	38
39	44.5544	44.7380	44.9226	45.1082	45.2947	45.4822	45.6707	45.8602	46.0506	39
40	45.8607	46.0549	46.2502	46.4465	46.6438	46.8423	47.0418	47.2423	47.4440	40
41	47.1760	47.3811	47.5874	47.7948	48.0034	48.2131	48.4240	48.6360	48.8492	41
42	48.5003	48.7168	48.9344	49.1533	49.3734	49.5948	49.8174	50.0413	50.2665	42
43	49.8338	50.0618	50.2912	50.5219	50.7540	50.9874	51.2222	51.4583	51.6958	43
44	51.1764	51.4164	51.6579	51.9009	52.1452	52.3911	52.6384	52.8871	53.1374	44
45	52.5282	52.7806	53.0346	53.2901	53.5472	53.8058	54.0661	54.3279	54.5913	45
46	53.8894	54.1545	54.4213	54.6898	54.9599	55.2318	55.5053	55.7806	56.0576	46
47	55.2598	55.5381	55.8181	56.1000	56.3836	56.6690	56.9563	57.2454	57.5364	47
48	56.6398	56.9315	57.2251	57.5207	57.8182	58.1177	58.4191	58.7225	59.0279	48
49	58.0292	58.3348	58.6424	58.9521	59.2639	59.5778	59.8937	60.2118	60.5321	49
50	59.4281	59.7480	60.0700	60.3943	60.7207	61.0494	61.3804	61.7136	62.0491	50
51	60.8367	61.1712	61.5080	61.8472	62.1888	62.5327	62.8791	63.2279	63.5791	51
52	62.2549	62.6045	62.9565	63.3111	63.6682	64.0278	64.3900	64.7548	65.1222	52
53	63.6829	64.0479	64.4156	64.7859	65.1589	65.5347	65.9132	66.2944	66.6785	53
54	65.1207	65.5016	65.8853	66.2718	66.6612	67.0535	67.4487	67.8469	68.2480	54
55	66.5685	66.9656	67.3657	67.7688	68.1750	68.5843	68.9967	69.4123	69.8309	55
56	68.0261	68.4399	68.8569	69.2771	69.7006	70.1273	70.5573	70.9907	71.4274	56
57	69.4938	69.9247	70.3590	70.7967	71.2378	71.6825	72.1306	72.5823	73.0375	57
58	70.9716	71.4200	71.8720	72.3277	72.7870	73.2500	73.7167	74.1871	74.6614	58
59	72.4595	72.9259	73.3961	73.8701	74.3480	74.8298	75.3156	75.8054	76.2991	59
60	73.9577	74.4424	74.9313	75.4241	75.9211	76.4222	76.9276	77.4371	77.9508	60

Part 3.--Future value where n is 1 to 60 and i is 10.5/12, 10.75/12, 11/12, 11.25/12, 11.5/12, 11.75/12, 1.0, 1.25, and 1.5 percent

	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	1.0	1.25	1.5	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1
2	2.0087	2.0090	2.0092	2.0094	2.0096	2.0098	2.0100	2.0125	2.0150	2
3	3.0263	3.0270	3.0276	3.0282	3.0288	3.0295	3.0301	3.0377	3.0452	3
4	4.0528	4.0541	4.0553	4.0566	4.0579	4.0591	4.0604	4.0756	4.0909	4
5	5.0883	5.0904	5.0925	5.0946	5.0968	5.0989	5.1010	5.1266	5.1523	5
6	6.1328	6.1360	6.1392	6.1424	6.1456	6.1488	6.1520	6.1907	6.2296	6
7	7.1865	7.1910	7.1955	7.2000	7.2045	7.2090	7.2135	7.2680	7.3230	7
8	8.2493	8.2554	8.2614	8.2675	8.2735	8.2796	8.2857	8.3589	8.4328	8
9	9.3215	9.3293	9.3372	9.3450	9.3528	9.3607	9.3685	9.4634	9.5593	9
10	10.4031	10.4129	10.4227	10.4326	10.4425	10.4523	10.4622	10.5817	10.7027	10
11	11.4941	11.5062	11.5183	11.5304	11.5425	11.5547	11.5668	11.7139	11.8633	11
12	12.5947	12.6093	12.6239	12.6385	12.6531	12.6678	12.6825	12.8604	13.0412	12
13	13.7049	13.7222	13.7396	13.7570	13.7744	13.7919	13.8093	14.0211	14.2368	13
14	14.8248	14.8452	14.8655	14.8860	14.9064	14.9269	14.9474	15.1964	15.4504	14
15	15.9545	15.9781	16.0018	16.0255	16.0493	16.0731	16.0969	16.3863	16.6821	15
16	17.0941	17.1213	17.1485	17.1758	17.2031	17.2304	17.2579	17.5912	17.9324	16
17	18.2437	18.2747	18.3057	18.3368	18.3679	18.3992	18.4304	18.8111	19.2014	17
18	19.4033	19.4384	19.4735	19.5087	19.5440	19.5793	19.6147	20.0462	20.4894	18
19	20.5731	20.6125	20.6520	20.6916	20.7313	20.7710	20.8109	21.2968	21.7967	19
20	21.7531	21.7972	21.8413	21.8856	21.9299	21.9744	22.0190	22.5630	23.1237	20
21	22.9435	22.9924	23.0415	23.0907	23.1401	23.1896	23.2392	23.8450	24.4705	21
22	24.1442	24.1984	24.2527	24.3072	24.3619	24.4166	24.4716	25.1431	25.8376	22
23	25.3555	25.4152	25.4750	25.5351	25.5953	25.6557	25.7163	26.4574	27.2251	23
24	26.5773	26.6429	26.7086	26.7745	26.8406	26.9069	26.9735	27.7881	28.6335	24
25	27.8099	27.8815	27.9534	28.0255	28.0978	28.1704	28.2432	29.1354	30.0630	25
26	29.0532	29.1313	29.2096	29.2882	29.3671	29.4462	29.5256	30.4996	31.5140	26
27	30.3074	30.3923	30.4774	30.5628	30.6485	30.7346	30.8209	31.8809	32.9867	27
28	31.5726	31.6645	31.7568	31.8493	31.9422	32.0355	32.1291	33.2794	34.4815	28
29	32.8489	32.9482	33.0479	33.1479	33.2484	33.3492	33.4504	34.6954	35.9987	29
30	34.1363	34.2434	34.3508	34.4587	34.5670	34.6757	34.7849	36.1291	37.5387	30

	10.5/12	10.75/12	11/12	11.25/12	11.5/12	11.75/12	1.0	1.25	1.5	
31	35.4350	35.5501	35.6657	35.7817	35.8983	36.0153	36.1327	37.5807	39.1018	31
32	36.7451	36.8686	36.9926	37.1172	37.2423	37.3679	37.4941	39.0504	40.6883	32
33	38.0666	38.1989	38.3317	38.4652	38.5992	38.7338	38.8690	40.5386	42.2986	33
34	39.3997	39.5411	39.6831	39.8258	39.9691	40.1131	40.2577	42.0453	43.9331	34
35	40.7444	40.8953	41.0469	41.1991	41.3521	41.5058	41.6603	43.5709	45.5921	35
36	42.1009	42.2616	42.4231	42.5854	42.7484	42.9123	43.0769	45.1155	47.2760	36
37	43.4693	43.6402	43.8120	43.9846	44.1581	44.3324	44.5076	46.6794	48.9851	37
38	44.8497	45.0312	45.2136	45.3970	45.5813	45.7665	45.9527	48.2629	50.7199	38
39	46.2421	46.4346	46.6281	46.8226	47.0181	47.2147	47.4123	49.8662	52.4807	39
40	47.6467	47.8506	48.0577	48.2615	48.4687	48.6770	48.8864	51.4896	54.2679	40
41	49.0636	49.2792	49.4960	49.7140	49.9332	50.1536	50.3752	53.1332	56.0819	41
42	50.4929	50.7207	50.9497	51.1801	51.4117	51.6447	51.8790	54.7973	57.9231	42
43	51.9348	52.1751	52.4168	52.6599	52.9044	53.1504	53.3978	56.4823	59.7920	43
44	53.3892	53.6425	53.8972	54.1536	54.4114	54.6708	54.9318	58.1883	61.6889	44
45	54.8563	55.1230	55.3913	55.6612	55.9328	56.2061	56.4811	59.9157	63.6142	45
46	56.3363	56.6168	56.8991	57.1831	57.4689	57.7565	58.0459	61.6646	65.5684	46
47	57.8293	58.1240	58.4206	58.7192	59.0196	59.3220	59.6263	63.4354	67.5519	47
48	59.3353	59.6447	59.9562	60.2697	60.5852	60.9029	61.2226	65.2284	69.5652	48
49	60.8545	61.1790	61.5057	61.8347	62.1658	62.4992	62.8348	67.0437	71.6087	49
50	62.3869	62.7271	63.0696	63.4144	63.7616	64.1112	64.4632	68.8818	73.6828	50
51	63.9328	64.2890	64.6477	65.0089	65.3726	65.7389	66.1078	70.7428	75.7881	51
52	65.4922	65.8649	66.2403	66.6183	66.9991	67.3826	67.7689	72.6271	77.9249	52
53	67.0653	67.4550	67.8475	68.2429	68.6412	69.0424	69.4466	74.5349	80.0938	53
54	68.6521	69.0593	69.4694	69.8827	70.2990	70.7185	71.1410	76.4666	82.2952	54
55	70.2528	70.6779	71.1062	71.5378	71.9727	72.4109	72.8525	78.4225	84.5296	55
56	71.8675	72.3111	72.7580	73.2085	73.6624	74.1199	74.5810	80.4027	86.7975	56
57	73.4964	73.9589	74.4250	74.8948	75.3684	75.8457	76.3268	82.4078	89.0995	57
58	75.1395	75.6214	76.1072	76.5970	77.0907	77.5883	78.0901	84.4379	91.4360	58
59	76.7969	77.2988	77.8049	78.3151	78.8294	79.3481	79.8710	86.4933	93.8075	59
60	78.4689	78.9913	79.5181	80.0493	80.5849	81.1250	81.6697	88.5745	96.2147	60

Part 4.--Future value where n is 1 to 60 and i is 1.75, 2.0, 2.25, 2.5, 2.75, 3.0, 4.0, 4.5, and 5.0 percent

	1.75	2.0	2.25	2.5	2.75	3.0	4.0	4.5	5.0	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1
2	2.0175	2.0200	2.0225	2.0250	2.0275	2.0300	2.0400	2.0450	2.0500	2
3	3.0528	3.0604	3.0680	3.0756	3.0833	3.0909	3.1216	3.1370	3.1525	3
4	4.1062	4.1216	4.1370	4.1525	4.1680	4.1836	4.2465	4.2782	4.3101	4
5	5.1781	5.2040	5.2301	5.2563	5.2827	5.3091	5.4163	5.4707	5.5256	5
6	6.2687	6.3081	6.3478	6.3877	6.4279	6.4684	6.6330	6.7169	6.8019	6
7	7.3784	7.4343	7.4906	7.5474	7.6047	7.6625	7.8983	8.0192	8.1420	7
8	8.5075	8.5830	8.6592	8.7361	8.8138	8.8923	9.2142	9.3800	9.5491	8
9	9.6564	9.7546	9.8540	9.9545	10.0562	10.1591	10.5828	10.8021	11.0266	9
10	10.8254	10.9497	11.0757	11.2034	11.3328	11.4639	12.0061	12.2882	12.5779	10
11	12.0148	12.1687	12.3249	12.4835	12.6444	12.8078	13.4864	13.8412	14.2068	11
12	13.2251	13.4121	13.6022	13.7956	13.9921	14.1920	15.0258	15.4640	15.9171	12
13	14.4565	14.6803	14.9083	15.1404	15.3769	15.6178	16.6268	17.1599	17.7130	13
14	15.7095	15.9739	16.2437	16.5190	16.7998	17.0863	18.2919	18.9321	19.5986	14
15	16.9844	17.2934	17.6092	17.9319	18.2618	18.5989	20.0236	20.7841	21.5786	15
16	18.2817	18.6393	19.0054	19.3802	19.7640	20.1569	21.8245	22.7193	23.6575	16
17	19.6016	20.0121	20.4330	20.8647	21.3075	21.7616	23.6975	24.7417	25.8404	17
18	20.9446	21.4123	21.8928	22.3863	22.8934	23.4144	25.6454	26.8551	28.1324	18
19	22.3112	22.8406	23.3853	23.9460	24.5230	25.1169	27.6712	29.0636	30.5390	19
20	23.7016	24.2974	24.9115	25.5447	26.1974	26.8704	29.7781	31.3714	33.0660	20
21	25.1164	25.7833	26.4720	27.1833	27.9178	28.6765	31.9692	33.7831	35.7193	21
22	26.5559	27.2990	28.0676	28.8629	29.6856	30.5368	34.2480	36.3034	38.5052	22
23	28.0207	28.8450	29.6992	30.5844	31.5019	32.4529	36.6179	38.9370	41.4305	23
24	29.5110	30.4219	31.3674	32.3490	33.3682	34.4265	39.0826	41.6892	44.5020	24
25	31.0275	32.0303	33.0732	34.1578	35.2858	36.4593	41.6459	44.5652	47.7271	25
26	32.5704	33.6709	34.8173	36.0117	37.2562	38.5530	44.3117	47.5706	51.1135	26
27	34.1404	35.3443	36.6007	37.9120	39.2808	40.7096	47.0842	50.7113	54.6691	27
28	35.7379	37.0512	38.4242	39.8598	41.3610	42.9309	49.9676	53.9933	58.4026	28
29	37.3633	38.7922	40.2888	41.8563	43.4984	45.2189	52.9663	57.4230	62.3227	29
30	39.0172	40.5681	42.1953	43.9027	45.6946	47.5754	56.0849	61.0071	66.4388	30

	1.75	2.0	2.25	2.5	2.75	3.0	4.0	4.5	5.0	
31	40.7000	42.3794	44.1447	46.0003	47.9512	50.0027	59.3283	64.7524	70.7608	31
32	42.4122	44.2270	46.1379	48.1503	50.2699	52.5028	62.7015	68.6662	75.2988	32
33	44.1544	46.1116	48.1760	50.3540	52.6523	55.0778	66.2095	72.7562	80.0638	33
34	45.9271	48.0338	50.2600	52.6129	55.1002	57.7302	69.8579	77.0303	85.0670	34
35	47.7308	49.9945	52.3908	54.9282	57.6155	60.4621	73.6522	81.4966	90.3203	35
36	49.5661	51.9944	54.5696	57.3014	60.1999	63.2759	77.5983	86.1640	95.8363	36
37	51.4335	54.0343	56.7974	59.7339	62.8554	66.1742	81.7022	91.0413	101.6281	37
38	53.3336	56.1149	59.0754	62.2273	65.5839	69.1594	85.9703	96.1382	107.7095	38
39	55.2670	58.2372	61.4046	64.7830	68.3875	72.2342	90.4091	101.4644	114.0950	39
40	57.2341	60.4020	63.7862	67.4026	71.2681	75.4013	95.0255	107.0303	120.7998	40
41	59.2357	62.6100	66.2214	70.0876	74.2280	78.6633	99.8265	112.8467	127.8398	41
42	61.2724	64.8622	68.7113	72.8398	77.2693	82.0232	104.8196	118.9248	135.2618	42
43	63.3446	67.1595	71.2574	75.6608	80.3942	85.4839	110.0124	125.2764	142.9933	43
44	65.4532	69.5027	73.8606	78.5523	83.6050	89.0484	115.4129	131.9138	151.1430	44
45	67.5986	71.8927	76.5225	81.5161	86.9042	92.7199	121.0294	138.8500	159.7002	45
46	69.7816	74.3306	79.2443	84.5540	90.2940	96.5015	126.8706	146.0982	168.6852	46
47	72.0027	76.8172	82.0273	87.6679	93.7771	100.3965	132.9454	153.6726	178.1194	47
48	74.2628	79.3535	84.8729	90.8596	97.3560	104.4084	139.2632	161.5879	188.0254	48
49	76.5624	81.9406	87.7825	94.1311	101.0333	108.5406	145.8337	169.8594	198.4267	49
50	78.9022	84.5794	90.7576	97.4843	104.8117	112.7969	152.6671	178.5030	209.3480	50
51	81.2830	87.2710	93.7997	100.9215	108.6940	117.1808	159.7738	187.5357	220.8154	51
52	83.7055	90.0164	96.9102	104.4445	112.6831	121.6962	167.1647	196.9748	232.8562	52
53	86.1703	92.8167	100.0906	108.0556	116.7819	126.3471	174.8513	206.8386	245.4990	53
54	88.6783	95.6731	103.3427	111.7570	120.9934	131.1375	182.8454	217.1464	258.7739	54
55	91.2302	98.5865	106.6679	115.5509	125.3207	136.0716	191.1592	227.9180	272.7126	55
56	93.8267	101.5583	110.0679	119.4397	129.7670	141.1538	199.8055	239.1743	287.3482	56
57	96.4687	104.5894	113.5444	123.4257	134.3356	146.3884	208.7978	250.9371	302.7157	57
58	99.1569	107.6812	117.0992	127.5113	139.0299	151.7800	218.1497	263.2293	318.8514	58
59	101.8921	110.8348	120.7339	131.6991	143.8532	157.3334	227.8757	276.0746	335.7940	59
60	104.6752	114.0515	124.4504	135.9916	148.8091	163.0534	237.9907	289.4980	353.5837	60

Part 5.--Future value where n is 1 to 60 and i is 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, and 9.0 percent

	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1
2	2.0550	2.0600	2.0650	2.0700	2.0750	2.0800	2.0850	2.0900	2
3	3.1680	3.1836	3.1992	3.2149	3.2306	3.2464	3.2622	3.2781	3
4	4.3423	4.3746	4.4072	4.4399	4.4729	4.5061	4.5395	4.5731	4
5	5.5811	5.6371	5.6936	5.7507	5.8084	5.8666	5.9254	5.9847	5
6	6.8881	6.9753	7.0637	7.1533	7.2440	7.3359	7.4290	7.5233	6
7	8.2669	8.3938	8.5229	8.6540	8.7873	8.9228	9.0605	9.2004	7
8	9.7216	9.8975	10.0769	10.2598	10.4464	10.6366	10.8306	11.0285	8
9	11.2563	11.4913	11.7319	11.9780	12.2298	12.4876	12.7512	13.0210	9
10	12.8754	13.1808	13.4944	13.8164	14.1471	14.4866	14.8351	15.1929	10
11	14.5835	14.9716	15.3716	15.7836	16.2081	16.6455	17.0961	17.5603	11
12	16.3856	16.8699	17.3707	17.8885	18.4237	18.9771	19.5492	20.1407	12
13	18.2868	18.8821	19.4998	20.1406	20.8055	21.4953	22.2109	22.9534	13
14	20.2926	21.0151	21.7673	22.5505	23.3659	24.2149	25.0989	26.0192	14
15	22.4087	23.2760	24.1822	25.1290	26.1184	27.1521	28.2323	29.3609	15
16	24.6411	25.6725	26.7540	27.8881	29.0772	30.3243	31.6320	33.0034	16
17	26.9964	28.2129	29.4930	30.8402	32.2580	33.7502	35.3207	36.9737	17
18	29.4812	30.9057	32.4101	33.9990	35.6774	37.4502	39.3230	41.3013	18
19	32.1027	33.7600	35.5167	37.3790	39.3532	41.4463	43.6654	46.0185	19
20	34.8683	36.7856	38.8253	40.9955	43.3047	45.7620	48.3770	51.1601	20
21	37.7861	39.9927	42.3490	44.8652	47.5525	50.4229	53.4891	56.7645	21
22	40.8643	43.3923	46.1016	49.0057	52.1190	55.4568	59.0356	62.8733	22
23	44.1118	46.9958	50.0982	53.4361	57.0279	60.8933	65.0537	69.5319	23
24	47.5380	50.8156	54.3546	58.1767	62.3050	66.7648	71.5832	76.7898	24
25	51.1526	54.8645	58.8877	63.2490	67.9779	73.1059	78.6678	84.7009	25
26	54.9660	59.1564	63.7154	68.6765	74.0762	79.9544	86.3546	93.3240	26
27	58.9891	63.7058	68.8569	74.4838	80.6319	87.3508	94.6947	102.7231	27
28	63.2335	68.5281	74.3326	80.6977	87.6793	95.3388	103.7437	112.9682	28
29	67.7114	73.6398	80.1642	87.3465	95.2553	103.9659	113.5620	124.1354	29
30	72.4355	79.0582	86.3749	94.4608	103.3994	113.2832	124.2147	136.3075	30

	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	
31	77.4194	84.8017	92.9892	102.0730	112.1544	123.3459	135.7730	149.5752	31
32	82.6775	90.8898	100.0335	110.2182	121.5659	134.2135	148.3137	164.0370	32
33	88.2248	97.3432	107.5357	118.9334	131.6834	145.9506	161.9203	179.8003	33
34	94.0771	104.1838	115.5255	128.2588	142.5596	158.6267	176.6836	196.9823	34
35	100.2514	111.4348	124.0347	138.2369	154.2516	172.3168	192.7017	215.7108	35
36	106.7652	119.1209	133.0969	148.9135	166.8205	187.1021	210.0813	236.1247	36
37	113.6373	127.2681	142.7482	160.3374	180.3320	203.0703	228.9382	258.3759	37
38	120.8873	135.9042	153.0269	172.5610	194.8569	220.3159	249.3980	282.6298	38
39	128.5361	145.0585	163.9736	185.6403	210.4712	238.9412	271.5968	309.0665	39
40	136.6056	154.7620	175.6319	199.6351	227.2565	259.0565	295.6825	337.8824	40
41	145.1189	165.0477	188.0480	214.6096	245.3008	280.7810	321.8156	369.2919	41
42	154.1005	175.9505	201.2711	230.6322	264.6983	304.2435	350.1699	403.5281	42
43	163.5760	187.5076	215.3537	247.7765	285.5507	329.5830	380.9343	440.8457	43
44	173.5727	199.7580	230.3517	266.1209	307.9670	356.9496	414.3137	481.5218	44
45	184.1192	212.7435	246.3246	285.7493	332.0645	386.5056	450.5304	525.8587	45
46	195.2457	226.5081	263.3357	306.7518	357.9694	418.4261	489.8255	574.1860	46
47	206.9842	241.0986	281.4525	329.2244	385.8171	452.9002	532.4606	626.8628	47
48	219.3684	256.5645	300.7469	353.2701	415.7533	490.1322	578.7198	684.2804	48
49	232.4336	272.9584	321.2955	378.9990	447.9348	530.3427	628.9110	746.8656	49
50	246.2175	290.3359	343.1797	406.5289	482.5299	573.7702	683.3684	815.0836	50
51	260.7594	308.7561	366.4864	435.9860	519.7197	620.6718	742.4547	889.4411	51
52	276.1012	328.2814	391.3080	467.5050	559.6987	671.3255	806.5634	970.4908	52
53	292.2868	348.9783	417.7430	501.2303	602.6761	726.0316	876.1213	1058.8349	53
54	309.3625	370.9170	445.8963	537.3164	648.8768	785.1141	951.5916	1155.1301	54
55	327.3775	394.1720	475.8795	575.9286	698.5425	848.9232	1033.4769	1260.0918	55
56	346.3832	418.8223	507.8117	617.2436	751.9332	917.8371	1122.3224	1374.5001	56
57	366.4343	444.9517	541.8195	661.4506	809.3282	992.2640	1218.7198	1499.2051	57
58	387.5882	472.6488	578.0377	708.7522	871.0278	1072.6451	1323.3110	1635.1335	58
59	409.9056	502.0077	616.6102	759.3648	937.3549	1159.4568	1436.7924	1783.2955	59
60	433.4504	533.1282	657.6898	813.5204	1008.6565	1253.2133	1559.9198	1944.7921	60

Part 6.--Future value where n is 1 to 60 and i is 9.5, 10.0, 10.5, 11.0, 11.5, 12.0, 12.5, and 13.0 percent

	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1
2	2.0950	2.1000	2.1050	2.1100	2.1150	2.1200	2.1250	2.1300	2
3	3.2940	3.3100	3.3260	3.3421	3.3582	3.3744	3.3906	3.4069	3
4	4.6070	4.6410	4.6753	4.7097	4.7444	4.7793	4.8145	4.8498	4
5	6.0446	6.1051	6.1662	6.2278	6.2900	6.3528	6.4163	6.4803	5
6	7.6189	7.7156	7.8136	7.9129	8.0134	8.1152	8.2183	8.3227	6
7	9.3426	9.4872	9.6340	9.7833	9.9349	10.0890	10.2456	10.4047	7
8	11.2302	11.4359	11.6456	11.8594	12.0774	12.2997	12.5263	12.7573	8
9	13.2971	13.5795	13.8684	14.1640	14.4663	14.7757	15.0921	15.4157	9
10	15.5603	15.9374	16.3246	16.7220	17.1300	17.5487	17.9786	18.4197	10
11	18.0385	18.5312	19.0387	19.5614	20.0999	20.6546	21.2259	21.8143	11
12	20.7522	21.3843	22.0377	22.7132	23.4114	24.1331	24.8791	25.6502	12
13	23.7236	24.5227	25.3517	26.2116	27.1037	28.0291	28.9890	29.9847	13
14	26.9774	27.9750	29.0136	30.0949	31.2207	32.3926	33.6126	34.8827	14
15	30.5402	31.7725	33.0600	34.4054	35.8110	37.2797	38.8142	40.4175	15
16	34.4416	35.9497	37.5313	39.1899	40.9293	42.7533	44.6660	46.6717	16
17	38.7135	40.5447	42.4721	44.5008	46.6362	48.8837	51.2493	53.7391	17
18	43.3913	45.5992	47.9317	50.3959	52.9993	55.7497	58.6554	61.7251	18
19	48.5135	51.1591	53.9645	56.9395	60.0942	63.4397	66.9873	70.7494	19
20	54.1222	57.2750	60.6308	64.2028	68.0051	72.0524	76.3608	80.9468	20
21	60.2638	64.0025	67.9970	72.2651	76.8257	81.6987	86.9058	92.4699	21
22	66.9889	71.4027	76.1367	81.2143	86.6606	92.5026	98.7691	105.4910	22
23	74.3529	79.5430	85.1311	91.1479	97.6266	104.6029	112.1152	120.2048	23
24	82.4164	88.4973	95.0699	102.1742	109.8536	118.1552	127.1296	136.8315	24
25	91.2459	98.3471	106.0522	114.4133	123.4868	133.3339	144.0208	155.6196	25
26	100.9143	109.1818	118.1877	127.9988	138.6878	150.3339	163.0234	176.8501	26
27	111.5012	121.0999	131.5974	143.0786	155.6369	169.3740	184.4013	200.8406	27
28	123.0938	134.2099	146.4151	159.8173	174.5351	190.6989	208.4515	227.9499	28
29	135.7877	148.6309	162.7887	178.3972	195.6067	214.5828	235.5079	258.5834	29
30	149.6875	164.4940	180.8815	199.0209	219.1014	241.3327	265.9464	293.1992	30

	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
31	164.9078	181.9434	200.8741	221.9132	245.2981	271.2926	300.1897	332.3151	31
32	181.5741	201.1378	222.9658	247.3236	274.5074	304.8477	338.7135	376.5161	32
33	199.8236	222.2515	247.3772	275.5292	307.0757	342.4294	382.0526	426.4632	33
34	219.8068	245.4767	274.3518	306.8374	343.3895	384.5210	430.8092	482.9034	34
35	241.6885	271.0244	304.1588	341.5896	383.8792	431.6635	485.6604	546.6808	35
36	265.6489	299.1268	337.0955	380.1644	429.0254	484.4631	547.3679	618.7493	36
37	291.8855	330.0395	373.4905	422.9825	479.3633	543.5987	616.7889	700.1867	37
38	320.6147	364.0434	413.7070	470.5106	535.4900	609.8305	694.8875	792.2110	38
39	352.0731	401.4478	458.1462	523.2667	598.0714	684.0102	782.7485	896.1984	39
40	386.5200	442.5926	507.2516	581.8261	667.8496	767.0914	881.5920	1013.7042	40
41	424.2394	487.8518	561.5130	646.8269	745.6523	860.1424	992.7910	1146.4858	41
42	465.5421	537.6370	621.4719	718.9779	832.4023	964.3595	1117.8899	1296.5289	42
43	510.7686	592.4007	687.7264	799.0655	929.1286	1081.0826	1258.6262	1466.0777	43
44	560.2917	652.6408	760.9377	887.9627	1036.9784	1211.8125	1416.9544	1657.6678	44
45	614.5194	718.9048	841.8361	986.6386	1157.2309	1358.2300	1595.0737	1874.1646	45
46	673.8987	791.7953	931.2289	1096.1688	1291.3125	1522.2176	1795.4579	2118.8060	46
47	738.9191	871.9749	1030.0080	1217.7474	1440.8134	1705.8838	2020.8902	2395.2508	47
48	810.1164	960.1723	1139.1588	1352.6996	1607.5069	1911.5898	2274.5015	2707.6334	48
49	888.0775	1057.1896	1259.7705	1502.4965	1793.3702	2141.9806	2559.8141	3060.6258	49
50	973.4448	1163.9085	1393.0464	1668.7712	2000.6078	2400.0182	2880.7909	3459.5071	50
51	1066.9221	1281.2994	1540.3162	1853.3360	2231.6777	2689.0204	3241.8898	3910.2430	51
52	1169.2797	1410.4293	1703.0494	2058.2029	2489.3206	3012.7029	3648.1260	4419.5746	52
53	1281.3612	1552.4723	1882.8696	2285.6053	2776.5925	3375.2272	4105.1417	4995.1193	53
54	1404.0905	1708.7195	2081.5710	2538.0218	3096.9006	3781.2545	4619.2845	5645.4849	54
55	1538.4791	1880.5914	2301.1359	2818.2042	3454.0442	4236.0050	5197.6950	6380.3979	55
56	1685.6347	2069.6506	2543.7552	3129.2067	3852.2593	4745.3257	5848.4069	7210.8496	56
57	1846.7700	2277.6156	2811.8495	3474.4194	4296.2691	5315.7647	6580.4578	8149.2601	57
58	2023.2131	2506.3772	3108.0937	3857.6056	4791.3401	5954.6565	7404.0150	9209.6639	58
59	2216.4184	2758.0149	3435.4435	4282.9422	5343.3442	6670.2153	8330.5169	10407.9202	59
60	2427.9781	3034.8164	3797.1651	4755.0658	5958.8287	7471.6411	9372.8315	11761.9498	60

Part 7.--Future value where n is 1 to 60 and i is 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, and 20 percent

	14.0	15.0	16.0	17.0	18.0	19.0	20.0	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1
2	2.1400	2.1500	2.1600	2.1700	2.1800	2.1900	2.2000	2
3	3.4396	3.4725	3.5056	3.5389	3.5724	3.6061	3.6400	3
4	4.9211	4.9934	5.0665	5.1405	5.2154	5.2913	5.3680	4
5	6.6101	6.7424	6.8771	7.0144	7.1542	7.2966	7.4416	5
6	8.5355	8.7537	8.9775	9.2068	9.4420	9.6830	9.9299	6
7	10.7305	11.0668	11.4139	11.7720	12.1415	12.5227	12.9159	7
8	13.2328	13.7268	14.2401	14.7733	15.3270	15.9020	16.4991	8
9	16.0853	16.7858	17.5185	18.2847	19.0859	19.9234	20.7989	9
10	19.3373	20.3037	21.3215	22.3931	23.5213	24.7089	25.9587	10
11	23.0445	24.3493	25.7329	27.1999	28.7551	30.4035	32.1504	11
12	27.2707	29.0017	30.8502	32.8239	34.9311	37.1802	39.5805	12
13	32.0887	34.3519	36.7862	39.4040	42.2187	45.2445	48.4966	13
14	37.5811	40.5047	43.6720	47.1027	50.8180	54.8409	59.1959	14
15	43.8424	47.5804	51.6595	56.1101	60.9653	66.2607	72.0351	15
16	50.9804	55.7175	60.9250	66.6488	72.9390	79.8502	87.4421	16
17	59.1176	65.0751	71.6730	78.9792	87.0680	96.0218	105.9306	17
18	68.3941	75.8364	84.1407	93.4056	103.7403	115.2659	128.1167	18
19	78.9692	88.2118	98.6032	110.2846	123.4135	138.1664	154.7400	19
20	91.0249	102.4436	115.3797	130.0329	146.6280	165.4180	186.6880	20
21	104.7684	118.8101	134.8405	153.1385	174.0210	197.8474	225.0256	21
22	120.4360	137.6316	157.4150	180.1721	206.3448	236.4385	271.0307	22
23	138.2970	159.2764	183.6014	211.8013	244.4868	282.3618	326.2369	23
24	158.6586	184.1678	213.9776	248.8076	289.4945	337.0105	392.4842	24
25	181.8708	212.7930	249.2140	292.1049	342.6035	402.0425	471.9811	25
26	208.3327	245.7120	290.0883	342.7627	405.2721	479.4306	567.3773	26
27	238.4993	283.5688	337.5024	402.0323	479.2211	571.5224	681.8528	27
28	272.8892	327.1041	392.5028	471.3778	566.4809	681.1116	819.2233	28
29	312.0937	377.1697	456.3032	552.5121	669.4475	811.5228	984.0680	29
30	356.7868	434.7451	530.3117	647.4391	790.9480	966.7122	1181.8816	30

	14.0	15.0	16.0	17.0	18.0	19.0	20.0	
31	407.7370	500.9569	616.1616	758.5038	934.3186	1151.3875	1419.2579	31
32	465.8202	577.1005	715.7475	888.4494	1103.4960	1371.1511	1704.1095	32
33	532.0350	664.6655	831.2671	1040.4858	1303.1253	1632.6698	2045.9314	33
34	607.5199	765.3654	965.2698	1218.3684	1538.6878	1943.8771	2456.1176	34
35	693.5727	881.1702	1120.7130	1426.4910	1816.6516	2314.2137	2948.3411	35
36	791.6729	1014.3457	1301.0270	1669.9945	2144.6489	2754.9143	3539.0094	36
37	903.5071	1167.4975	1510.1914	1954.8936	2531.6857	3279.3481	4247.8112	37
38	1030.9981	1343.6222	1752.8220	2288.2255	2988.3891	3903.4242	5098.3735	38
39	1176.3378	1546.1655	2034.2735	2678.2238	3527.2992	4646.0748	6119.0482	39
40	1342.0251	1779.0903	2360.7572	3134.5218	4163.2130	5529.8290	7343.8578	40
41	1530.9086	2046.9539	2739.4784	3668.3906	4913.5914	6581.4965	8813.6294	41
42	1746.2358	2354.9969	3178.7949	4293.0169	5799.0378	7832.9808	10577.3553	42
43	1991.7088	2709.2465	3688.4021	5023.8298	6843.8646	9322.2472	12693.8263	43
44	2271.5481	3116.6334	4279.5465	5878.8809	8076.7603	11094.4741	15233.5916	44
45	2590.5648	3585.1285	4965.2739	6879.2907	9531.5771	13203.4242	18281.3099	45
46	2954.2439	4123.8977	5760.7177	8049.7701	11248.2610	15713.0748	21938.5719	46
47	3368.8380	4743.4824	6683.4326	9419.2310	13273.9480	18699.5590	26327.2863	47
48	3841.4753	5456.0047	7753.7818	11021.5002	15664.2586	22253.4753	31593.7436	48
49	4380.2819	6275.4055	8995.3869	12896.1553	18484.8251	26482.6356	37913.4923	49
50	4994.5213	7217.7163	10435.6488	15089.5017	21813.0937	31515.3363	45497.1908	50
51	5694.7543	8301.3737	12106.3526	17655.7170	25740.4505	37504.2502	54597.6289	51
52	6493.0199	9547.5798	14044.3690	20658.1888	30374.7316	44631.0578	65518.1547	52
53	7403.0427	10980.7167	16292.4680	24171.0809	35843.1833	53111.9588	78622.7856	53
54	8440.4687	12628.8243	18900.2629	28281.1647	42295.9563	63204.2309	94348.3427	54
55	9623.1343	14524.1479	21925.3050	33089.9627	49910.2284	75214.0348	113219.0113	55
56	10971.3731	16703.7701	25434.3538	38716.2564	58895.0696	89505.7014	135863.8135	56
57	12508.3654	19210.3356	29504.8504	45299.0199	69497.1821	106512.7847	163037.5763	57
58	14260.5365	22092.8859	34226.6264	53000.8533	82007.6749	126751.2137	195646.0915	58
59	16258.0117	25407.8188	39703.8867	62011.9984	96770.0563	150834.9444	234776.3098	59
60	18535.1333	29219.9916	46057.5085	72555.0381	114189.6665	179494.5838	281732.5718	60

Appendix table 5--Values of the correction factor $\left[\frac{i}{j_p}\right]$ when conversion period differs from payment period[1/]

i / p	1 1/8	1 1/4	1 1/2	1 3/4	2
1/4	.9833	.9814	.9778	.9741	.9705
1/2	.9944	.9938	.9926	.9913	.9901
2	1.0028	1.0031	1.0037	1.0044	1.0050
4	1.0042	1.0047	1.0056	1.0065	1.0075
6	1.0047	1.0052	1.0062	1.0073	1.0083
12	1.0051	1.0057	1.0069	1.0080	1.0091

i / p	2 1/4	2 1/2	2 3/4	3	3 1/2
1/4	.9669	.9633	.9597	.9561	.9490
1/2	.9889	.9877	.9864	.9852	.9828
2	1.0056	1.0062	1.0068	1.0074	1.0087
4	1.0084	1.0093	1.0103	1.0112	1.0130
6	1.0093	1.0104	1.0114	1.0124	1.0145
12	1.0103	1.0114	1.0125	1.0137	1.0159

i / p	4	4 1/2	5	5 1/2	6
1/4	.9420	.9350	.9280	.9212	.9144
1/2	.9804	.9780	.9756	.9732	.9709
2	1.0099	1.0111	1.0123	1.0136	1.0148
4	1.0149	1.0167	1.0186	1.0204	1.0222
6	1.0165	1.0186	1.0206	1.0227	1.0247
12	1.0182	1.0205	1.0227	1.0250	1.0272

i / p	6 1/2	7	7 1/2	8	8 1/2
1/2	.9685	.9662	.9639	.9615	.9569
2	1.0160	1.0172	1.0184	1.0196	1.0220
4	1.0241	1.0259	1.0277	1.0295	1.0331
6	1.0268	1.0288	1.0308	1.0328	1.0369
12	1.0295	1.0317	1.0339	1.0362	1.0406

i / p	10	11	12	13	14
2	1.0244	1.0268	1.0292	1.0315	1.0339
4	1.0368	1.0404	1.0439	1.0475	1.0511
6	1.0409	1.0449	1.0489	1.0529	1.0568
12	1.0450	1.0495	1.0539	1.0583	1.0626

[1/] In this table, i is rate of interest or discount per period and p is the number of payments per conversion period.