**Time Value of Money**

**Practice Problems**

**TIME VALUE AND PRESENT VALUE FORMULAS**

WHERE *i* = Nominal Yearly Rate Of Interest *m* = Number of times per year compounded *n* = number of years

FUTURE VALUE OF A SUM  FUTURE VALUE OF AN ANNUITY 

PRESENT VALUE OF A SUM 

PRESENT VALUE OF AN ANNUITY ***TIME VALUE OF MONEY***

 1. If you buy a factory for $250,000 and the terms are 20% down, the balance to be paid off over 30 years at a 12% rate of interest on the unpaid balance, what are the 30 equal annual payments? [$24,828.73]

2. You have $1,000 invested in an account which pays 8% compounded annually. You have found an equally safe deposit which will pay 8%, quarterly compounding, for 2 years. How much additional interest will you earn by shifting accounts? [$5.26]

3. If $100 is placed into an account that earns a nominal 4% compounded quarterly, what will it be worth 5 years from today? [$122.02]

4. Suppose you have $2 million in a 2-year account paying a 6% nominal rate, compounded annually. Another bank offers you an account for 2 years paying a 6% nominal rate, but compounded bimonthly (that is, 6 times a year). If you move your account, how much additional interest will you earn over the 2 years? [$6,450.06]

5. You deposit $1,000 in a savings account paying 8% interest, compounded quarterly. Eighteen months later, you decide to go to the mountains and you close out your account. How much money will you receive? [$1,126.16]

6. The present value (t = 0) of the following cash flow stream is $5,979.04 when discounted at 12% annually. What is the value of the MISSING (t = 2) cash flow? [$3,000.00 rounded off]

 0 1 2 3 4

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 $0 $1,000 $? $2,000 $2,000

7. A rich aunt promises you $35,000 exactly 5 years after you graduate from college. What is the value of the promised $35,000 if you could negotiate payment upon graduation? Assume an interest rate of 12 percent. [$19,859.94]

8. You place $5,000 in your bank at an annual interest rate of 12 percent compounded monthly. How much will you have in 2 years if all interest remains in the accounts? [$6,348.67]

9. Find the present value for the following income stream if the interest rate is 12 percent and the payments occur at the end of each year. [$5,001.74]

 YEARS CASHFLOW

 1-4 $ 500

 5-10 $ 800

 11-15 $1,200

10. Find the present value of the cash flows shown using a discount rate of 8 percent. Assume that each payment occurs at the end of the year. [$1,166.80]

 YEAR CASHFLOW

 1-4 $100/yr.

 5 200

 6 300

 7-15 100/yr.

 16 400

11. What is the present value of an investment that promises to pay $10,000 for the first five years and $20,000 for the second five years if the discount rate is 18 percent? [$58,610]

12. If you have $5,436 in an account that has been paying an annual rate of 10%, compounded continuously, since you deposited some funds 10 years ago, how much was the original deposit? [$1,999.79]

1. If you earn 5%, how long will it take your money to double? [14.21 years]

14. If you earn 7.5%, how long will it take your money to triple? [15.19 years]