

Worksheet 6-5: Present Value with Compound Interest**Principal Investigation: What is the principal P when A , i , and n are given?**Solve the formula $A = P(1 + i)^n$ for P .

$$A = P(1 + i)^n$$

$$P = \underline{\hspace{2cm}}$$

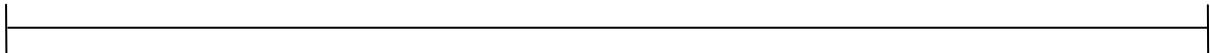
or

$$P = \underline{\hspace{2cm}}$$

 P is the principal or present value or discounted value **A is the final amount or future value** **i is the interest rate per compounding period** **n is the total number of compounding periods****Practice:**

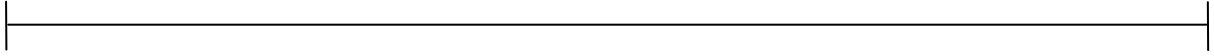
1. What principal must be invested today in order to grow to \$2000 in three years, at 5% per year, compounded annually?

Timeline Diagram:

 $A =$ $i =$ $n =$

2. Sam wants to invest enough money today to have \$3200 for tuition when he goes to college in two years. If he invests his money at 6% per year, compounded monthly, how much does he need to invest?

Timeline Diagram:



$A =$

$i =$

$n =$

3. Mr. Paul Martin plans to invest some money on the birth of his granddaughter, so that there will be \$10 000 on her 16th birthday. He will invest his money at 8% per year, compounded semi-annually. How much does he have to invest today?

$A =$

$i =$

$n =$

4. Angel needs to pay of \$1000 debt in 1 year. Her creditor, the bank, is willing to accept payment today, discounted at an interest rate of 9% per year, compounded quarterly. How much is her creditor willing to accept today?

$A =$

$i =$

$n =$

5. Tiffany has a loan for \$5000 that is due in four years. She wants to pay off her debt early. The creditor is willing to discount the loan at an interest rate of 8% per year, compounded semi-annually. How much would the creditor be willing to accept today?

$A =$

$i =$

$n =$

6. Investment Plan A at 4%, compounded monthly, worth \$5000 in 8 years.
Investment Plan B at 6%, compounded quarterly, worth \$6000 in 10 years

Which investment is worth more today and by how much?



7. \$2979.69 was repaid for a loan of \$2000 at 8% per year, compounded monthly. Determine the term of the loan in number of years.

8. Interest on a \$5000 loan is 4.8% per year, compounded monthly. The loan is due in six years. If the creditor were to sell the loan to another creditor, discounted at 4.2% per year, compounded quarterly,

(a) how much would the new creditor pay?

(b) how much would the original creditor earn on selling the loan?

9. Tony borrowed \$2700 at 8.6% per year, compounded quarterly. After the first year, he repaid \$1000. He is expected to repay the loan in full after three years. How much must he repay?

Answers: **1.** \$1727.68; **2.** \$2838.99; **3.** \$2850.58; **4.** \$914.84; **5.** \$3653.45;
6. Plan A: \$3632.68, Plan B: \$3307.57, Plan A is worth \$325.11 more today;
7. 5 years (60 months); **8.** (a) \$3891.33, (b) \$140.37 (\$3891.33 – \$3750.96); **9.** \$2299.66.