Simple Interest Worksheet

Key

1) a) The formula for simple interest is: $I = Prt$

b) Rearrange this formula to find:

i) Time: $t = \frac{I}{Pr}$

ii) The interest rate: $r = \frac{I}{Pt} \times 100\%$

iii) The Principal: $P = \frac{I}{rt}$

Answer each of the following...

2) If Michael invests $2000 in the bank at a rate of 5.5% for 6 years how much interest will he make?

$I = 2000(0.055)(6)$

$I = \$660$

3) Kelsey takes out a loan for $6000 to start a business after high school. The bank charges her 8% interest for the loan. After 5 years how much interest will be added on to the loan? $I = 6000(0.08)(5)$

$I = \$2400$

4) Jessie invests $3345 in the stock market. Over the 3 years she has this invested she gets an average return of 7.8%. How much will her investment be worth after the 3 years? $A = 3345 + 3345(0.078)(3)$

$A = \$4127.73$

5) Scott takes gets a student loan to go to college after high school. If he pays $750 in interest at a rate of 3%, how much must the loan have been for originally?

* assume $t = 1$ year

$P = \frac{I}{rt}$

$P = \frac{750}{0.03(1)}$

$P = \$25000$

6) Taylor has just won $4,250 from the 50/50 at the Sea Dog's game and decides to invest all of it. If he makes $1275 with a 5% interest rate, how long must he have had the money invested? $t = \frac{1275}{4250(0.05)}$

$t = 6$ years

7) At what rate would you need to invest $12000 and make $2880 after 8 years?

$r = \frac{2880}{12000(8)} \times 100\%$

$r = 3\%$

8) What will the total value of an investment of $5000 be if it has an interest rate of 7% and is invested for 20 years? $A = 5000 + 5000(0.07)(20)$

$A = \$12000$

9) Morgan has an investment worth $130,000 dollars after 20 years. If his original investment was for $50,000 what must the interest rate have been?

$I = 130000 - 50000$

$I = 80000$

$r = \frac{80000}{50000(20)} \times 100\%$

$r = 8\%$

Practice With Compound Interest...

Worksheet - Introduction to Compound Interest.doc

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Text Simple Interest

p. 452 #1-6, 10, 11

2. Cam has $5000 to invest. He wants his principal to grow to $6500 in 5 years so that he can afford a new drum kit.
   a) What simple interest rate will allow him to meet his goal?
   b) Suppose that interest is paid semi-annually and Cam withdraws all the money after 3.25 years. How much money will he have?

$I = A - P$
$= 6500 - 5000$
$= 1500$

a) $r = \frac{I}{Pt}$

$r = \frac{1500}{5000(5)} \times 100\%$

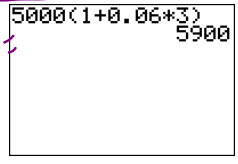
$r = 6\%$

b) $t = 3$ yrs

$A = P(1 + rt)$ OR $A = P + Prt$

$A = 5000 + 5000(0.06)(3)$

$A = \$5900$



8.3 Compound Interest: Future Value

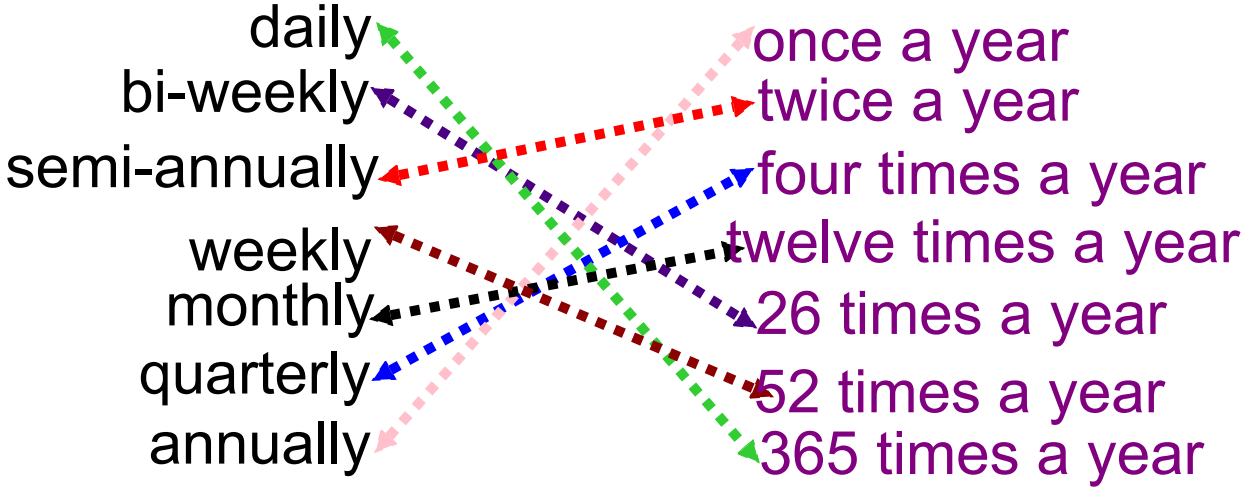
$$A = P\left(1+\frac{r}{n}\right)^{nt}$$

GOAL

Determine the future value of an investment that earns compound interest.

Terminology Tango

Click on the picture to verify the match.



EXAMPLE #1: If $1000 is invested at 8 %/a compounded semi-annually for 2 years, how much will the investment be worth?

Using the simple interest formula...

I = 1000(0.08)(6/12)
= $40 (after 1st interest period)

New principal = 1000 + 40
= $1040

I = 1040(0.08)(6/12)
= $41.60 (after 2nd interest period)

New Principal = 1040 + 41.60
= $1081.60

I = 1081.60(0.08)(6/12)
= $43.26 (after 3rd interest period)

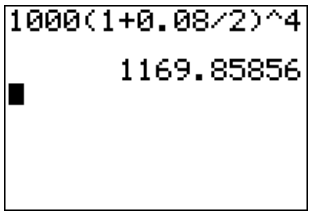
New Principal = 1081.60 + 43.26
= $1124.86

I = 1124.86(0.08)(6/12)
= $44.99 (after 4th interest period)

New Principal = 1124.86 + 44.99
= $1169.85

Compound Interest Formula...

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$



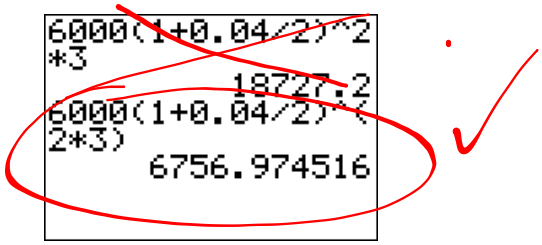
EXAMPLE #2:

Calculate the final value of an initial investment of $6000.00. Interest is paid at 4% per annum, compounded semi-annually, for three years.

A = final value of the investment ...(principal + interest)
P = principal
r = annual interest rate
n = number of compounding periods in a year
t = term of the investment or loan in number of years

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 6000\left(1 + \frac{0.04}{2}\right)^{(2)(3)}$$



EX #3: Maggie invests $30 000 at 10% /a compounded quarterly for 20 years. Determine...

a) How much will this investment be worth?

b) How much interest did you earn?

c) ROR?

a)

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30000(1+0.10/4)^
80
     216287.0345
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b) $I = 216287.03 - 30000$

$I = 186287.03$

c) $ROR = \frac{\$ \text{ earn}}{\$ \text{ invest}} \times 100\%$

$= \frac{186287.03}{30000} \times 100\%$

$= 621\%$

EXAMPLE #4...

A keen MVHS student wants to save some money from their summer employment. They decide to take out a Canada Savings Bond which pays 2.5 % interest per year compounded monthly. If the student invests $850 into the bond, how much interest will they earn if they don't touch the money for 3 years?

$A = 850\left(1 + \frac{0.025}{12}\right)^{3\times 12}$

$A = \$916.13$

$I = 916.13 - 850$

$\$66.13$

$ROR = \frac{66.13}{850} \times 100\%$

$= 8\%$

HOMEWORK...

Text p. 452: #12

p. 457: #1, 2

p. 468: #2, 6, 7

ROR = $ earn / $ invest

Simple

I = Prt

&

A = P + I

A = P + Prt

A= P(1 + rt)

I
P r t

Compound

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$I = A - P$$

Attachments

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