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? $A = 5000 + 5000(0.07)(20)$

$A = \$12000$

$A = P + I$

$I = A - P$

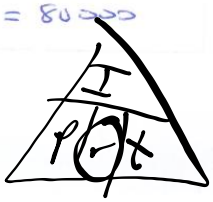
9) Morgan has an investment worth $130,000 dollars after 20 years. If his original investment was for $50,000 what must the interest rate have been?

$I = 130000 - 50000$

$I = 80000$

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

$r = 8\%$



Text Simple Interest

p. 452 #1-6, 10, 11

$ROR = \frac{\$\ \text{earn}}{\$\ \text{invested}} \times 100\%$

3. a) Principal of $1000 is invested at 5% simple interest, paid annually, for 5 years. What is the rate of return?

b) Which option below would yield the greatest future value? What is the rate of return for this option?

A. increasing the principal to $1050
B. increasing the interest rate to 6%
C. paying interest every 6 months
D. increasing the term to 6 years

a) $I = 1000(0.05)(5)$

c) $I = \$250$ ← earn

$ROR = \frac{250}{1000} \times 100$

$= 25\%$

b) A)

```
1050(0.05)(5)
                262.5
Ans/1050*100
                   25
```

B)

```
1000(0.06)(5)
                300
Ans/1000*100
                  30
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D)

```
1000(0.05)(6)
                300
Ans/1000*100
                  30
```

Practice With Compound Interest...

Worksheet - Introduction to Compound Interest.doc

Worksheet Solutions - Compound Interest.pdf

11. A bank is offering a simple interest rate of 3.2% for a guaranteed investment certificate with a 5-year term.

a) What principal would you need to invest if you wanted to have $20 000 at the end of the term?

b) How long would it take for the value of the GIC to be $25 000?

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

$P = \frac{A}{(1+rt)}$

$P = \frac{20000}{(1+0.032(5))}$

$P = \$17241.38$

$A = P + Prt$

$A = P(1+rt)$

$\frac{A}{(1+rt)} = \frac{P(1+rt)}{(1+rt)}$

$\frac{A}{(1+rt)} = P$

b) $t = \frac{I}{Pr}$

$I = A - P$

$I = 20000 - 17241.38$

$I = \$2758.32$

$t = \frac{2758.32}{17241.38(0.05)}$

$t = 3.2 \text{ years}$

8.3 Compound Interest: Future Value

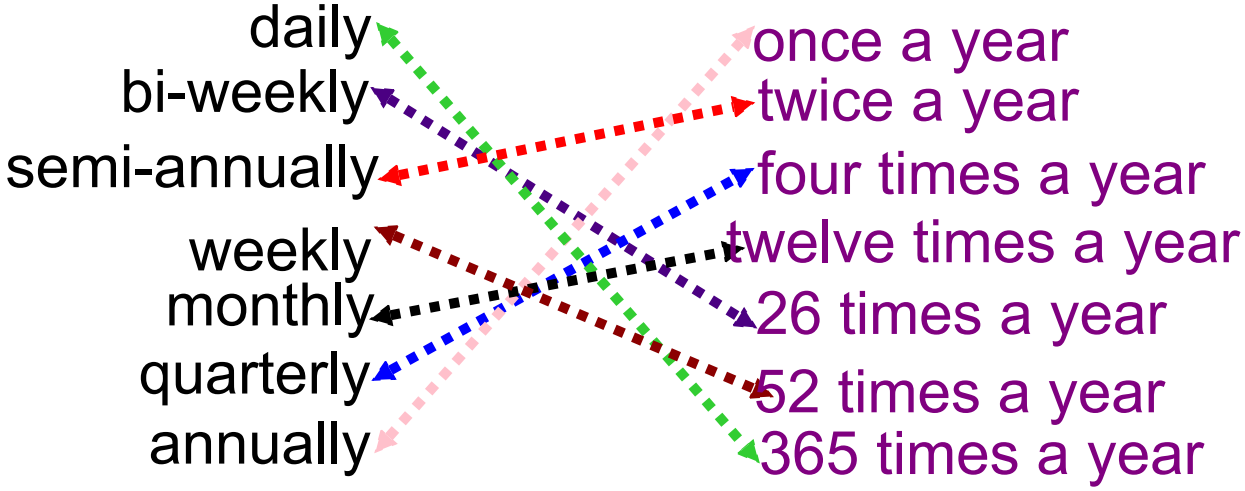
$$A = P\left(1+\frac{r}{n}\right)^{nt}$$

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)

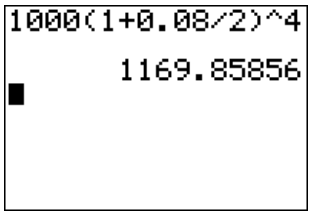
New Principal = 1081.60 + 43.26
= $1124.86

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.

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

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

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

EX #3: Miramichi Rural won $31 865 on Gold Rush TODAY!!! Ms Burns If they decide to invest all of it at 10% /a compounded quarterly for 20 years.

Determine...

a) How much will this investment be worth?

A =

```
31865(1+0.10/4)^
80
     229732.8785
```

229 732.88

b) How much interest did you earn?

I =

```
229732.88-31865
        197867.88
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c) ROR = $earn / $invest

= 197867.88 / 31865 x100%

= 621%

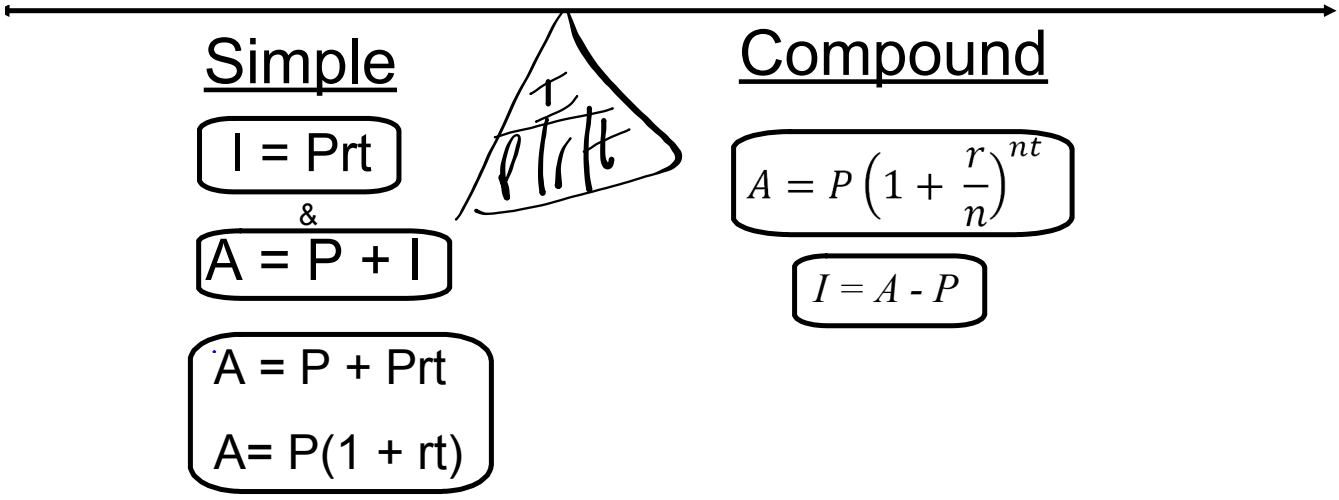
HOMEWORK...

Text p. 452: #12

p. 457: #1, 2

p. 468: #2, 6, 7

ROR = $ earned / $ invest



Attachments

Worksheet - Introduction to Compound Interest.doc

Worksheet Solutions - Compound Interest.pdf