

HOMWORK... ???

p. 457: #1, 2

p. 468: #2, (6), 7

Simple

$$I = Prt$$

&

$$A = P + I$$

$$A = P + Prt$$

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

Compound

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

$$I = A - P$$

6. Trust funds are investments that are set up for a specific purpose. A local business invested \$250 000 in a charitable trust fund so that a school can offer scholarships. The interest rate is 3.8%, compounded semi-annually. Only the interest earned can be used to provide the scholarships. How much is available from the trust fund for scholarships each year?

$$A = 250000 \left(1 + \frac{0.038}{2}\right)^{2 \times 1}$$

```

A = 250000(1+0.038/2)^2
    259590.25
Ans-250000
    9590.25
I =
    
```

7. Suppose that you are searching online for the best interest rates on a GIC. You find these rates:

- Bank A offers 6.6%, compounded annually.
- Bank B offers 6.55%, compounded semi-annually.
- Bank C offers 6.5%, compounded quarterly.

Rank these rates from greatest to least return on an investment of \$20 000 for a term of 2 years.

(A)

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A = 20000(1+0.066/1)^2
    22727.12
Ans-20000
    I = 2727.12
    
```

(B)

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A = 20000(1+0.0655/2)^4
    22751.54062
Ans-20000
    I = 2751.540622
    
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(C)

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A = 20000(1+0.065/4)^8
    22752.77984
Ans-20000
    I = 2752.779838
    
```

Practice With Compound Interest...

 Worksheet - Introduction to Compound Interest.doc

 Worksheet Solutions - Compound Interest.pdf

How to make money???



EXAMPLE 4 | Comparing interest on investments with different compounding periods
p. 463

Céline wants to invest \$3000 so that she can buy a new car in the next 5 years. Céline has the following investment options:

- A. 4.8% compounded annually
- B. 4.8% compounded semi-annually
- C. 4.8% compounded monthly
- D. 4.8% compounded weekly
- E. 4.8% compounded daily



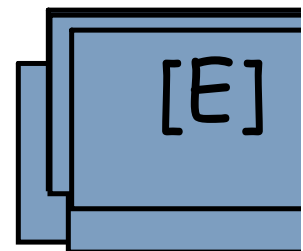
$$3000(1+0.048/1)^5 = 3792.518151$$

$$3000(1+0.048/2)^{10} = 3802.951801$$

$$3000(1+0.048/12)^{60} = 3811.922156$$

$$3000(1+0.048/52)^{(52*5)} = 3813.325288$$

$$3000(1+0.048/365)^{(365*5)} = 3813.687273$$



p. 465

EXAMPLE 5 Estimating doubling times for investments

Both Berta and Kris invested \$5000 by purchasing Canada Savings Bonds. Berta's CSB earns 8%, compounded annually, while Kris's CSB earns 9%, compounded annually.

- a) Estimate the doubling time for each CSB.

Rule of 72

A simple formula for estimating the doubling time of an investment; 72 is divided by the annual interest rate as a percent to estimate the doubling time of an investment in years.

The Rule of 72 is most accurate when the interest is compounded annually.

$$\text{Rule of 72} = \frac{72}{\text{Rate}}$$

Doubling Time =>

Berta

$$\frac{72}{8} = 9 \text{ years}$$

Kris

$$\frac{72}{9} = 8 \text{ years}$$

Present Value...

\$ needed to invest NOW to get a fixed amount later

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

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

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

8.4

Compound Interest: Present Value

GOAL

Determine the principal or present value of an investment, given its future value and compound interest rate.

EXAMPLE 2
p. 475

Determining the present value of an investment that is compounded quarterly

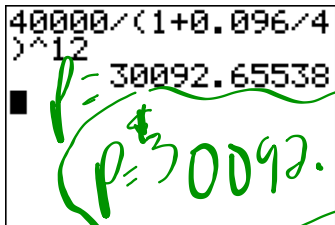
Agnes and Bill are musicians. They have researched the costs to set up a small recording studio. They estimate that \$40 000 will pay for the soundproofing, recording equipment, and computer hardware and software that they need. They plan to set up the studio in 3 years and have invested money at 9.6% compounded quarterly, to save for it.



- a) How much money should they have invested? $P = ?$
- b) How much interest will they earn over the term of their investment?

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

$$P = \frac{40000}{(1 + \frac{0.096}{4})^{4 \times 3}}$$

$P =$ 

$$b) I = A - P$$

$$I = 40000 - 30092.66$$

$$I = \$9907.34$$

HOMEWORK...

p. 468: **Rule of 72...**

#3 (only estimate the doubling time)

#5a & #8

Compound Interest (Future Value)

#10 & #12

p. 478: **Compound Interest (Present Value)**

#4, #6, #7, & #9

Attachments

Worksheet - Introduction to Compound Interest.doc

Worksheet Solutions - Compound Interest.pdf