

8.5 Effects of Changing the Conditions on Investments and Loans (Fall 2017) December 14, 2017

Lesson Warm-up 

Date: Dec. 14/17

1. If a bank pays you interest 4 mes per year, how many mes will the bank pay you interest in 10 years?

Answer: 40

2. Convert to a decimal:

a) 8%

$$= 0.08$$

b) 12.5%

$$= 0.125$$

c)  $3\frac{1}{4}\%$

$$= 3.25\% \\ = 0.0325$$

3. Using the formula  $A = P(1+i)^n$ , find the amount an investment of \$5000 grows to in 3 years, if interest is 10% per year compounded semi-annually.

$$A = ?$$

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

$$P = 5000$$

$$= 5000\left(1 + \frac{0.10}{2}\right)^6$$

$$i = \frac{0.10}{2}$$

$$= 6700.478$$

$$h = 3 \times 2 \\ = 6$$

$$= \$6700.48$$

4. Homework Queson: p. 440 #7

7. An investment fund pays 6.3% per year, compounded monthly. How much should a 25-year-old woman invest in the fund to have \$50 000 by age 35? 10 years

$$A = 50000$$

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

$$P = ?$$

$$50000 = P\left(1 + \frac{0.063}{12}\right)^{120}$$

$$i = \frac{0.063}{12}$$

$$\frac{50000}{\left(1 + \frac{0.063}{12}\right)^{120}} = P$$

$$h = 10 \times 12 \\ = 120$$

$$\frac{50000}{\left(1 + \frac{0.063}{12}\right)^{120}} = P$$

$$P = 26673.511$$

$$= \$26673.51$$

Before we begin, are there any questions from last day's work?

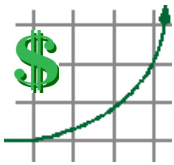
## Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) compare the effects of changing the conditions on investments, for example, the interest rate and/or compounding period.

*This means we want to calculate the future amounts, and determine which is the better investment. (earns more)*

MBF3CI The Effects of Changing the Conditions on Investments and Loans



Date: DEC. 14/17

**Ex. 1** Suppose you invest \$1000. You have narrowed down to two banks that you will deal with "Bank A" will give you 5% per year compounded annually for 4 years, and "Bank B" will pay you 5% per year compounded semi-annually for 4 years. Assuming they provide the same level of customer service, which bank should you invest with? Explain.

<p>2 A = ? P = 1000 i = <math>\frac{0.05}{1}</math> n = 4 x 1 = 4</p>	<p>Bank A 1 <math>A = P(1+i)^n</math> <math>A = 1000 \left(1 + \frac{0.05}{1}\right)^4</math> <math>\doteq 1215.506</math> <math>\doteq \\$1215.51</math></p>	<p>Bank B A = ? P = 1000 i = <math>\frac{0.05}{2}</math> n = 4 x 2 = 8</p>	<p><math>A = P(1+i)^n</math> <math>A = 1000 \left(1 + \frac{0.05}{2}\right)^8</math> <math>\doteq 1218.402</math> <math>\doteq \\$1218.40</math> <math>\therefore</math> invest with "Bank B" to earn an extra \$2.89</p>
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**Ex. 2** Your friend told you about "Bank C" that will pay you 4.9% per year compounded monthly for 4 years. Assuming they provide the same level of customer service, should you invest your money in "Bank B" (from Ex. 1) or "Bank C"? Explain.

<p>2 A = ? P = 1000 i = <math>\frac{0.049}{12}</math> n = 4 x 12 = 48</p>	<p>Bank C 1 <math>A = P(1+i)^n</math> <math>A = 1000 \left(1 + \frac{0.049}{12}\right)^{48}</math> <math>\doteq 1216.041</math> <math>\doteq \\$1216.04</math> <math>\therefore</math> "Bank B" is still the best investment of these 3 choices. However, you would have \$0.53 more than Bank A, but with a <i>lower</i> interest rate).</p>
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