

Are there any Homework Questions you would like to see on the board?

pp. 459-461 # 1 – 4, 6 – 8, 10

(Correct p. 460 # 6 from yesterday)

Today's Learning Goal(s):

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

- a) Calculate the amount of an investment for a variety of compounding periods.

MCF 3MI

8.2 Compound Interest: Determining Future Value

Date: Jan 6/20

$$A = P(1+i)^n \quad \text{or} \quad FV = PV(1+i)^n$$

Ex. 1: Compare investing \$1400 for 5 years in the following compound-interest accounts.

OPTION A: 12%/a compounded annually

OPTION B: 12%/a compounded semi-annually

OPTION C: 12%/a compounded quarterly

$y^x \quad x^n \quad \wedge$

OPTION A:

$$A=?$$

$$P=1400 \quad A = 1400 \left(1 + \frac{0.12}{1}\right)^5$$

$$i = \frac{0.12}{1} = 0.12$$

$$n = 5 \times 1 = 5$$

$$A = 1400(1 + 0.12)^5 = \$2467.278$$

$$= \$2467.28$$

OPTION B:

$$A=?$$

$$P=1400 \quad A = 1400 \left(1 + \frac{0.12}{2}\right)^{10}$$

$$i = \frac{0.12}{2} = 0.06$$

$$n = 5 \times 2 = 10$$

$$A = 1400(1 + .06)^{10} = \$2507.186$$

$$= \$2507.19$$

OPTION C:

$$A=?$$

$$P=1400 \quad A = 1400 \left(1 + \frac{0.12}{4}\right)^{20}$$

$$i = \frac{0.12}{4} = 0.03$$

$$n = 5 \times 4 = 20$$

$$A = 1400(1 + .03)^{20} = \$2528.555$$

$$= \$2528.56$$

NOTE:

The amount of an investment increases as the number of compounding periods increases.

Ex. 2: Compare investing \$825 for 4 years:

a) 7½ %/a compounded monthly.

b) 7½ %/a simple interest.

c) Determine the difference between these investments at the end of the 4th year.

$r = 7\frac{1}{2}\%$
 $= 7.5\%$
 $= 0.075$

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

b) $I = Prt$

c) Difference = compounded monthly - simple

$A=? \quad A = 825 \left(1 + \frac{0.075}{12}\right)^{48}$

$I=? \quad I = 825(0.075)(4)$

$= \$1112.594 - 1072.50$
 $= \$40.09$

$P = 825 \quad = 1112.594$

$P = 825 \quad = 247.5$

$i = \frac{0.075}{12} \quad = \1112.59

$r = 0.075 \quad = 247.50$

$n = 4 \times 12 = 48$

$t = 4$

$A = P + I$
 $= 825 + 247.50$
 $= \$1072.50$

Revisit Today's Learning Goals

Homework: pp. 468-469 # 1 - 3, 5, 8, 12

Revisit Today's Learning Goals

Today's Homework:

pp. 468-469 # 1 – 3, 5, 8, 12