

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)

7e
10a**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.

- p. 460 4. Calculate the simple interest earned or due and the amount at the end of each term.
- \$500 invested at 6% for 4 years
 - \$2000 invested at 4.8% for 5 years
 - \$1250 borrowed at 3% for 18 months
 - \$1000 borrowed at 10% for 12 weeks
 - \$5000 borrowed at $5\frac{1}{2}\%$ for 40 days

$$I = Prt$$

$$A = P + I$$

$$I = ?$$

$$= 5000(0.055)\left(\frac{40}{365}\right)$$

$$= 5000 + 30.14$$

$$P = 5000$$

$$\doteq 30.136$$

$$= \$5030.14$$

$$r = 5\frac{1}{2}\%$$

$$= \$30.14$$

$$= 5.5\%$$

$$= 0.055$$

$$t = \frac{40}{365}$$

p. 460 6. Calculate the missing information in the table.

	Principal, P (\$)	Interest Rate, r (%)	Time, t	Simple Interest, I (\$)
a)	735.00	$5\frac{1}{2} = 5.5\% = 0.055$	$\frac{27 \text{ days}}{365}$	
b)		$8.25 = 0.0825$	$\frac{240 \text{ days}}{365}$	138.25
c)	182.65	$6.75 = 0.0675$		23.28
d)	260.00		$\frac{2 \text{ months}}{12}$	16.50

$$\begin{aligned} \text{a) } I &= Prt \\ &= 735(0.055)\left(\frac{27}{365}\right) \\ &= 2.990 \\ &= \$2.99 \end{aligned}$$

$$\begin{aligned} \text{b) } I &= Prt \\ 138.25 &= P(0.0825)\left(\frac{240}{365}\right) \\ \frac{138.25}{(0.0825)\left(\frac{240}{365}\right)} &= P \\ P &= 2548.547 \\ &= \$2548.55 \end{aligned}$$

$$\begin{aligned} \text{c) } I &= Prt \\ 23.28 &= 182.65(0.0675)t \\ \frac{23.28}{182.65(0.0675)} &= t \\ t &= 1.888 \text{ years} \end{aligned}$$

$$\begin{aligned} \text{d) } I &= Prt \\ 16.50 &= 260n\left(\frac{2}{12}\right) \end{aligned}$$

$$\frac{16.50}{260\left(\frac{2}{12}\right)} = r$$

$$\begin{aligned} r &= 0.3807 \\ &= 38.07\% \end{aligned}$$

MCF 3MI

8.2 Compound Interest: Determining Future Value

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

Date: May 30/19

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

OPTION A:

$$\begin{aligned} A=? \\ P=1400 \\ i = \frac{0.12}{1} \\ = 0.12 \\ n = 5 \times 1 \\ = 5 \end{aligned} \quad \begin{aligned} A &= 1400 \left(1 + \frac{0.12}{1}\right)^5 \\ A &= 1400(1+0.12)^5 \\ &= \$2467.278 \\ &= \$2467.28 \end{aligned}$$

OPTION B:

$$\begin{aligned} A=? \\ P=1400 \\ i = \frac{0.12}{2} \\ = 0.06 \\ n = 5 \times 2 \\ = 10 \end{aligned} \quad \begin{aligned} A &= 1400 \left(1 + \frac{0.12}{2}\right)^{10} \\ A &= 1400(1+.06)^{10} \\ &= \$2507.186 \\ &= \$2507.19 \end{aligned}$$

OPTION C:

$$\begin{aligned} A=? \\ P=1400 \\ i = \frac{0.12}{4} \\ = 0.03 \\ n = 5 \times 4 \\ = 20 \end{aligned} \quad \begin{aligned} A &= 1400 \left(1 + \frac{0.12}{4}\right)^{20} \\ A &= 1400(1+.03)^{20} \\ &= \$2528.555 \\ &= \$2528.56 \end{aligned}$$

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.

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

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

$$P = 825$$

$$i = \frac{7\frac{1}{2}\%}{12}$$

$$= \frac{7.5\%}{12} \\ = \frac{0.075}{12}$$

$$n = 4 \times 12 \\ = 48$$

$$= 1112.594$$

$$= 1112.59$$

b) $I = Prt$

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

$$P = 825$$

$$r = 7.5\%$$

$$= 0.075$$

$$t = 4$$

$$= 247.50$$

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

c) Difference = compounded monthly - simple

$$= \$1112.594 - 1072.50$$

$$= \$40.09$$

Revisit Today's Learning Goals

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