

MCF 3MI

8.R Unit 8 Review

Date: Jan. 10/20**Simple Interest**

$$A = P + I$$

where $I = Prt$

I =Interest (\$Value)

P =Principal (\$Value)

r =rate of interest (as a **decimal**)

t =time (in **years**)

$$I = Prt$$

$$A = P + I$$

$$= P + Prt$$

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

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

vs.

Compound Interest

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

$$FV = PV(1 + i)^n$$

$$\frac{A}{(1 + i)^n} = P$$

A =Amount (\$Value) at the end

i =interest **per compounding period**

n =number of **compounding periods**

$$A = \frac{R \left[(1 + i)^n - 1 \right]}{i}$$

A is the amount or future value

R is the deposit or payment

i is the interest rate per compounding period

n is the total number of deposits

Know the compounding period names/times per year:

annually	1
semi-annually	2
quarterly	4
monthly	12
weekly	52
daily	365

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

p. 522 # 1 - 11 8, 5, 6, 11

- p. 522 5. An investment of \$1500 grows to \$3312.06 in 10 years. What is the interest rate of the investment if interest is compounded **quarterly?**

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

$$A = 3312.06 \quad 3312.06 = 1500 \left(1 + \frac{r}{4}\right)^{40}$$

$$P = 1500$$

$$i = \frac{r}{4} \quad \frac{3312.06}{1500} = \left(1 + \frac{r}{4}\right)^{40}$$

$$n = 10 \times 4 = 40 \quad \sqrt[40]{\frac{3312.06}{1500}} = 1 + \frac{r}{4}$$

$$\sqrt[40]{\frac{3312.06}{1500}} - 1 = \frac{r}{4}$$

$$4 \left(\sqrt[40]{\frac{3312.06}{1500}} - 1 \right) = r$$

$$r = 0.0800\dots$$

$$\therefore \text{rate} = 8\%$$

- p. 522 6. Kadie invested \$3000 at 6%/a compounded quarterly. How long will it take for the investment to be worth \$8500?

$$A = 8500 \quad A = P(1+i)^n$$

$$P = 3000 \quad 8500 = 3000 \left(1 + \frac{0.06}{4}\right)^{4t}$$

$$i = \frac{0.06}{4} \quad \frac{8500}{3000} = (1.015)^{4t}$$

$$N = t \times 4 = 4t \quad \frac{85}{30} = (1.015)^{4t}$$

∴

TUM solver or "Logs" Needed

$$t = 17.48 \quad \text{OMIT QUESTION}$$

p. 522 8. At the end of every 6 months, Parvati deposited \$200 into a savings account that paid 3.5%/a compounded semi-annually. She made the first deposit when her son was 6 months old and the last deposit on his 18th birthday. The money remained in the account until he turned 21. How much did Parvati's son receive?

$$A = \frac{R((1+i)^n - 1)}{i}$$

$$= \frac{200((1 + 0.0175)^{36} - 1)}{0.0175}$$

$R = 200$

$i = \frac{0.035}{2} = 0.0175$

$n = 18 \times 2 = 36$

$= 9913.225$

$= \$9913.23$

$A = P = 9913.23$

$A = 9913.23(1 + 0.0175)^6$

$= 11000.734$

$= \$11000.73$

$i = 3 \times 2 = 6$

p. 523 11. Raymond has \$53 400 in his savings account, and he withdraws \$250 at the end of every 3 months. If the account earns 5%/a compounded quarterly, what will his bank balance be at the end of 4 years?

$A =$

$R = 250$

$i = \frac{0.05}{4} = 0.0125$

$n = 4 \times 4 = 16$

TVM Calculator Advanced

Mode End Beginning

Present Value

Payments

Future Value

Annual Rate (%)

Periods

Compounding