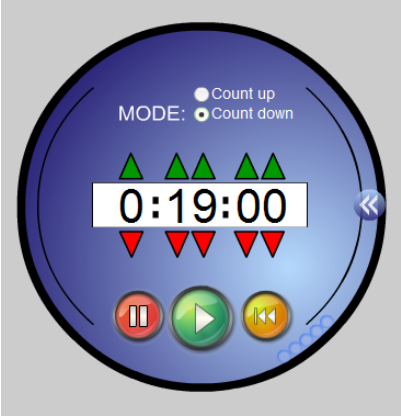
Date: _____

Begin with **SWYK 8.1** (formative),
then correct in class.

Today's Learning Goal(s):

By the end of the class, I will be:

a) ready for the Unit 8 Summative.



Last day's work: pp. 520-521 #1, 2b, 3ac, 5, 7

p. 520

1. Each situation represents a loan.

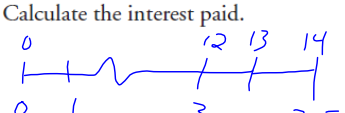
i) Draw a timeline to represent the amount of the original loan.

ii) Write the series that represents the amount of the original loan.

iii) Calculate the amount of the original loan.

iv) Calculate the interest paid.

	Regular Payment	Rate of Compound Interest per Year	Compounding Period	Time
a)	$650 per year	3.7%	annually	5 years
b)	$1200 every 6 months	9.4%	semi-annually	9 years
c)	$84.73 per quarter	3.6%	quarterly	$3\frac{1}{2}$ years
d)	$183.17 per month	6.6%	monthly	10 years



$\frac{84.73}{(1.009)^1}$

$\vdots$

$\frac{84.73}{(1.009)^{14}}$

$i = \frac{0.036}{4} = 0.009$

$n = 3.5 \times 4 = 14$

$r = 1 + i = 1.009$

iii) $S_n = \frac{a(r^n - 1)}{r - 1}$

$S_{14} = \frac{\frac{84.73}{(1.009)^{14}}(1.009^{14} - 1)}{0.009}$

$= 1109.851$

$= \$1109.85$

iv) I = Payment Total − Principal (PV)

$= (84.73)(14) - 1109.85$

$= 1186.22 - 1109.85$

$= \$76.37$

p. 520

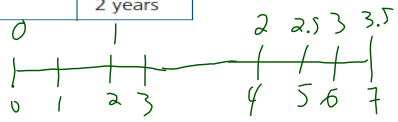
2. Each situation represents a simple, ordinary annuity.

i) Calculate the present value of each payment.

ii) Write the present values of the payments as a series.

iii) Calculate the present value of the annuity.

	Regular Payment	Rate of Compound Interest per Year	Compounding Period	Time
a)	$8000 per year	9%	annually	7 years
b)	$300 every 6 months	8% $= 0.08$	semi-annually	3.5 years
c)	$750 per quarter	8%	quarterly	2 years



$i = \frac{0.08}{2} = 0.04$

$\therefore r = 1 + i$

$r = 1.04$

$r - 1 = 0.04$

$n = 3.5 \times 2 = 7$

$\frac{300}{(1.04)^1}$

$\frac{300}{(1.04)^7}$

ii) $S_n = \frac{300}{1.04^7} + \frac{300}{1.04^6} + \ldots + \frac{300}{1.04^1}$

i) $P_1 = \frac{300}{1.04^1} \quad \ldots \quad P_7 = \frac{300}{1.04^7}$

$= 288.46 \qquad = 227.975$

$= 227.98$

$S_n = \frac{a(r^n - 1)}{r - 1}$

$S_7 = \frac{300}{(1.04)^7}\left(\frac{1.04^7 - 1}{0.04}\right)$

$= 1800.616$

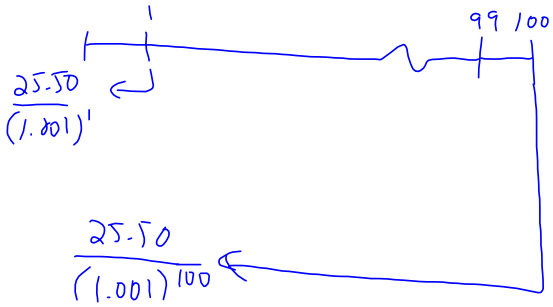
$= \$1800.62$

p. 520

3. Calculate the present value of each annuity.

K

	Regular Payment	Rate of Compound Interest per Year	Compounding Period	Time
a)	$5000 per year	7.2%	annually	5 years
b)	$250 every 6 months	4.8%	semi-annually	12 years
c)	$25.50 per week	5.2%	weekly	100 weeks
d)	$48.50 per month	23.4%	monthly	$2\frac{1}{2}$ years



$i = \frac{0.052}{52}$

$= 0.001$

$\therefore r = 1.001$

$a = \frac{25.50}{(1.001)^{100}}$ $n = 100$

$S_n = \frac{a(r^n - 1)}{r - 1}$

$S_{100} = \frac{\frac{(25.50)}{100}\left(1.001^{100} - 1\right)}{\frac{1.001}{1.001 - 1}}$

$= \frac{(25.50)(1.001^{100} - 1)}{0.001}$

$\doteq 2425.492$

$\doteq \$2425.49$

Formulae

Simple Interest

$I = Prt$

$A = P(1 + rt)$

Compound Interest

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

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

$A = P + I$

$I = A - P$

Annuity

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

Future Value

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

Present Value

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

8.R2 Review (Day 2)

Date: _____

Ex.1 Note the rounding error.

$R = 28$

$i = \frac{.08}{12} = ?$

$n = 35 \times 12 = 420$

$$FV = \frac{28\left((1+i)^{420}-1\right)}{i}$$

$$= \frac{28\left(\left(1+\frac{1}{150}\right)^{420}-1\right)}{\left(\frac{1}{150}\right)}$$

$$= 57,347.06$$

$\frac{.08}{12} = \frac{8}{1200} = \frac{1}{150} = i$

OR if $i = .0066$

$$FV = \frac{28\left(1.0066^{420}-1\right)}{.0066}$$

$$= 56,233.37$$

more than $1000 different due to rounding.

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

Last day's work: pp. 520-521 #1, 2b, 3ac, 5, 7

Today's Homework Practice includes:

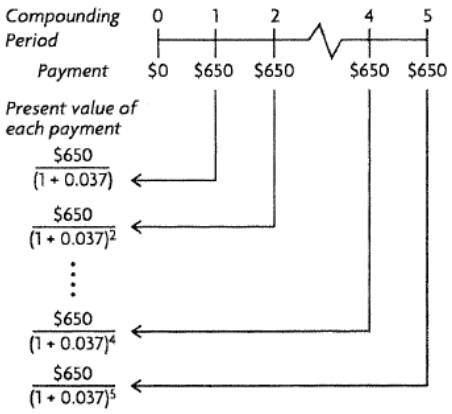
Be fully prepared for

Thursday's **Unit 8 Summave** !

pp. 534-535 #1 – 15, 17
p. 536 #1 – 5

8.5 Annuities: Present Value, pp. 520–522

1. a) i) There are 5 payments: $i = 3.7\%/a$ compounded annually



ii) $PV = 650(1.037)^{-1} + 650(1.037)^{-2} + 650(1.037)^{-3} + \cdots + 650(1.037)^{-5}$

iii) $PV = 650 \times \dfrac{1 - 1.037^{-5}}{0.037} = \$2918.24$

$PV = \frac{650}{1.037^5} + \frac{650}{1.037^4} + \frac{650}{1.037^3} + \frac{650}{1.037^2} + \frac{650}{1.037^1}$

$a = \frac{650}{1.037^5}$ $r = 1.037$