Name: _____

Ch. 1 Review

A1. Millie invests $2350 at 7% per year simple interest.   Calculate the value of the investment after 5 years.

$$I = Prt = 2350(0.07)(5)$$
$$= 822.50$$

$$Total = 2350 + 822.50 =$$ $\boxed{\$3172.50}$

C1. Calculate the rate of return on Millie's investment.

$$RoR = \frac{I}{P} = \frac{822.50}{2350} = 0.35 = \boxed{35\%}$$

A2. 8 years ago Julian invested $25 000 at 2.3% per annum simple interest. How much is his investment worth today?

$$I = 25000(0.023)(8)$$
$$= 4600$$

$$Total = 25000 + 4600 =$$ $\boxed{\$29\ 600}$

B1. 10 years ago Raina bought a GIC that earned 4.5% per year simple interest. It is now worth $20 000. How much was the GIC originally bought for?

$$A = P(1 + rt)$$
$$20\ 000 = P(1 + 0.045 \cdot 10)$$
$$\frac{20\ 000}{1.45} = \frac{P(1.45)}{1.45}$$

$\boxed{P = \$13793.10}$

B2. Billy invested $3500 in a GIC that earns 5% per year simple interest.   The GIC is now worth $5000. For how many years was the money invested?

$$I = 5000 - 3500 = 1500$$

$$1500 = 3500(0.05)t$$
$$\frac{1500}{175} = \frac{175t}{175}$$

$\boxed{t = 8.6 \text{ years}}$

C2. Calculate the rate of return on Billy's investment.

$$RoR = \frac{I}{P} = \frac{1500}{3500} = 0.43 = \boxed{43\%}$$

D1. Danielle invests $2800 at 3.5% p.a. compounded annually for 4 years. Calculate the value of the investment.

$$A = P(1+i)^n$$
$$= 2800 (1 + 0.035)^4$$
$$= 2800 (1.035)^4 \qquad = \boxed{\$ 3213.06}$$

E1. Determine the total interest earned on Danielle's investment.

$$I = 3213.06 - 2800$$
$$= \boxed{\$ 413.06}$$

F1. How long would it take for Danielle's investment to double in value? (Hint: use the rule of 72!)

$$\frac{72}{3.5} = \boxed{20.6 \text{ years}}$$

D2. Sam invests $3000 for 10 years.   Compare the following by calculating the value of the investments:

a) 6% p.a. compounded semi-annually

$$i = \frac{0.06}{2} = 0.03$$
$$n = 2 \times 10 = 20$$

$$A = 3000 (1 + 0.03)^{20}$$
$$= \boxed{\$ 5418.33}$$

b) 6% p.a. compounded quarterly

$$i = \frac{0.06}{4} = 0.015$$
$$n = 4 \times 10 = 40$$

$$A = 3000 (1 + 0.015)^{40}$$
$$= \boxed{\$ 5442.06}$$

c) 6% p.a. compounded monthly

$$i = \frac{0.06}{12} = 0.005$$
$$n = 12 \times 10 = 120$$

$$A = 3000 (1 + 0.005)^{120}$$
$$= \boxed{\$ 5458.19}$$

E2. Determine the total amount of interest earned for each of the questions in D2.

a) $5418.33 - 3000 = \boxed{\$ 2418.33}$

b) $5442.06 - 3000 = \boxed{\$ 2442.06}$

c) $5458.19 - 3000 = \boxed{\$ 2458.19}$

G1. Manuel would like to make an investment so that he'll have $9000 in 5 years. The bank offers a rate of 2.5% p.a. compounded annually. How much should he invest?

$$9000 = P(1+0.025)^5$$

$$\frac{9000}{(1.025)^5} = \frac{P(1.025)^5}{(1.025)^5}$$

$$\boxed{P = \$7954.69}$$

G2. Helen wants to invest some money so that her grandson Tim will have $25 000 for college in 18 years. The bank offers a rate of 4.2% p.a. compounded semi-annually. How much should she invest?

$$i = \frac{0.042}{2} = 0.021$$

$$n = 2 \times 18 = 36$$

$$25000 = P(1+0.021)^{36}$$

$$\frac{25000}{(1.021)^{36}} = \frac{P(1.021)^{36}}{(1.021)^{36}}$$

$$\boxed{P = 11830.78}$$

H1. Sally invests $2000 at 2.7% p.a. compounded monthly for 6 years. Use the TVM solver to determine the future value of her investment.

N = 6×12 = 72   ★ FV =
I = 2.7   PY = 12
PV = -2000   CY = 12
PMT = 0   BEGIN

$$\boxed{\$2351.29}$$

H2. Sally wants her $2000 investment to grow to $3000 in those 6 years. What interest rate will she need?

N = 6×12 = 72   FV = 3000
★ I =   PY = 12
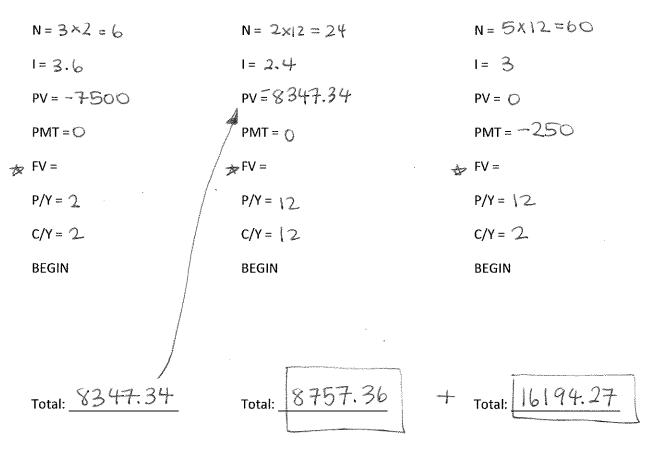PV = -2000   CY = 12
PMT = 0   BEGIN

$$\boxed{6.8\%}$$

H3. Becky invests $5000 at 3.2% p.a. compounded quarterly. She needs $8000 to buy a used car. How long will it take until she has enough money to purchase the car?

★ N =   FV = 8000
I = 3.2   PY = 4
PV = -5000   CY = 4
PMT = 0   BEGIN

$$\boxed{59 \text{ quarters}}$$
$$\div 4$$
$$= \boxed{14.75 \text{ years}}$$

I1. Tony deposited $275 per month for 2 years. If the account pays 1.75% p.a. compounded quarterly, how much will he have?

N = 2×12 = 24   ★ FV =
I = 1.75   PY = 12
PV = 0   CY = 4
PMT = -275   BEGIN

$$\boxed{\$6721.49}$$

I2. Nicole invests $3000 per year at 7.2% p.a. compounded semi-annually. How much will she have in 3 years?

N = 3x1 = 3   ✱ FV =
I = 7.2   PY = 1
PV = O   CY = 2
PMT = -3000   BEGIN

$10384.98

I3. Samuel deposited a certain amount into his account every month. How much should he invest each month at 5% p.a. compounded annually in order to have $10 000 in 4 years?

N = 4x12 = 48   FV = 10000
I = 5   PY = 12
PV = O   CY = 1
↗ PMT =   BEGIN

$188.28

J1. Gabriel invested $7500 in a GIC for a 3 year term at 3.6% p.a. compounded semi-annually. At the end of the term, he transferred the money into a savings account that paid 2.4% p.a. compounded monthly. During the time, he was also making regular monthly payments of $250 into a savings account that earned 3% p.a. compounded semi-annually. What was the total value of his investment after 5 years?

N = 3x2 = 6   N = 2x12 = 24   N = 5x12 = 60

I = 3.6   I = 2.4   I = 3

PV = -7500   PV = 8347.34   PV = O

PMT = O   PMT = O   PMT = -250

✱ FV =   ✱ FV =   ✱ FV =

P/Y = 2   P/Y = 12   P/Y = 12

C/Y = 2   C/Y = 12   C/Y = 2

BEGIN   BEGIN   BEGIN

Total: 8347.34   Total: 8757.36   + Total: 16194.27

Total Value of the investment: $24951.63