/45

Name: _____

Unit Test – Personal Finance, Savings & Vehicles

Formulas:

Simple Interest:

$I = Prt$ ← in years

$A = P + I$

Compound Interest:

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

$I = A - P$

Present Value:

$PV = A(1 + i)^{-n}$

Time Period	# of compounds/year
Annual	1
Semi-annual	2
Quarterly	4
Monthly	12
Bi-weekly	26
Weekly	52
Daily	365

Round all money answers to two decimal places.

1. Calculate the amount of **simple interest** earned from $2500 at an interest rate of 6.8% over: *[3 marks]*

a) 10 years b) 8 months c) 89 days

$\frac{6.8\%}{100\%} = 0.068$

a) $I = Prt$
$= (2500)(0.068)(10)$
$I = \$1700.00$

b) $I = Prt$
$= (2500)(0.068)(\frac{8}{12})$
$I \doteq \$113.33$

c) $I = Prt$
$= (2500)(0.068)(\frac{89}{365})$
$\doteq \$41.45$

2. Kate invested in a GIC that paid 4.8% **simple interest**. In 4 years, she earned $86.40 in interest. How much did she invest originally? *[2 marks]*

(r = 4.8%, t = 4 years, I = $86.40)

$I = Prt$
$86.40 = P(0.048)(4)$
$\frac{86.40}{0.192} = \frac{P(0.192)}{0.192}$
$P = \$450.00$

3. ~~Jack's investment matured making $350 in **simple interest**. It was invested at a simple~~ interest rate of 5.5%. How long was it invested for (in years)? *[3 marks]*

4. What rate of **simple interest** is needed for $1000 to grow to $1500, in 8 years? *[2 marks]*

r?

$500 = (1000)(r)(8)$

$\frac{500}{8000} = \frac{(8000)(r)}{8000}$

$I = A - P$

$I = 1500 - 1000 = 500$

$r = 0.0625 \quad \times 100\% = 6.25\%$

5. Calculate (*i*) as it would appear in the formula for the given situations. *[3 marks]*

a) 8% monthly

$i = \frac{0.08}{12}$

$i = 0.00\overline{6}66$

b) 6.4% quarterly

$i = \frac{0.064}{4}$

$i = 0.016$

c) 7% semi-annually

$i = \frac{0.07}{2}$

$i = 0.035$

6. Calculate (n) as it would appear in the formula for the given information. *[3 marks]*

a) semi-annually for 7 years

$n = 2 \times 7$

$n = 14$

b) monthly for 4 years

$n = 12 \times 4$

$n = 48$

c) daily for 5 weeks

$n = 365 \times \left(\frac{5}{52}\right)$

$n \doteq 35$

or $n = 7 \times 5 = 35$

7. Determine the **amount** of each investment. *[6 marks]*

a) $3200 invested at 5.6% compounded semi-annually for 8 years

2

P = 3200 A = $3200(1.028)^{16}$

$i = \frac{0.056}{2} = 0.028$ $A \doteq 4977.83$

n = $2 \times 8 = 16$

b) $700 invested at 4.25% compounded monthly for 3 years

12

P = 700 A = $700\left(1 + \frac{0.0425}{12}\right)^{36}$

$i = \frac{0.0425}{12}$ $A \doteq 795.01$

n = $12 \times 3 = 36$

8. Sawyer borrowed $35 000 for a new sports car, at 6.5%, compounded monthly, for 4 years.

i. How much will he have to repay? *[3 marks]*

$P = 35000$

$i = \frac{0.065}{12}$

$n = 12 \times 4 = 48$

$A = 35000\left(1 + \frac{0.065}{12}\right)^{48}$

$A = \$45\,360.72$.

ii. How much of what he will repay is interest? *[1 marks]*

$I = A - P$

$= 45\,360.72 - 35\,000$

$= \$10\,360.72$

9. At the end of 5 years, after being charged interest at 3% per year, compounded monthly, Hurley had to pay $10 135.11. How much did Hurley originally borrow? *[3 marks]*

$PV = 10135.11\left(1 + \frac{0.03}{12}\right)^{-60}$

$= \$8725.00$

10. Charlie is purchasing a used vehicle from a car dealer. The dealer offers ~~her~~ him two payment options.

Plan A: pay $3750 now

Plan B: pay a $1500 down payment now and $2450 in one year.

If current interest rate is 4% per year, compounded semi-annually, which plan is the better deal? Explain and show your calculations. *[4 marks]*

Plan A

$3750

Plan B

$1500 no interest

$A = 2450\left(1 + \frac{0.04}{2}\right)^{2}$

$A = \$2548.98$

Total $= 2548.98 + 1500$

$= \$4048.98$

11. If you were to use the **TVM Solver** on the graphing calculators, state the values that should be entered for each of the variables in the TVM solver. Put the word "answer" in where your answer should be calculated. *[6 marks]*

Question A: What amount needs to be invested at 2.8% interest compounded weekly if you have $650 after 3 years?

N = _____

I%= _____

PV = _____

PMT = 0

FV = _____

P/Y = 1

C/Y = _____

Question B: If $3000 is invested in a term deposit that pays 6.6% per year, compounded semi-annually. How long will it take for his investment to triple in value?

N = _____

I%= _____

PV = _____

PMT = 0

FV = _____

P/Y = 1

C/Y = _____

12. Locke's January credit card statement shows a balance of $1586. Payment is due on January 12. The minimum payment is the greater of $25 or 3.5% of the balance. Locke made the minimum payment on January 15. He did not make any purchases in January or February and paid the balance in full on February 4 (the date of his February statement). The annual interest rate is 18.6%.

a) What was the amount of the minimum payment Locke made on January 15? *[1 mark]*

$0.035 \times \$1586$
$= \$55.51$ ← this is more than #25

Lock must make a minimum payment of $55.51.

b) How much interest was he charged up to January 15? *[3 marks]*

$P = 1586$
$i = \frac{0.186}{365}$
$n = 3$

$A = 1586\left(1+\frac{0.186}{365}\right)^3$
$A = 1588.43$
$I = A - P = \$2.43$

c) What amount did Locke pay in February to pay off the balance? *[2 marks]*

1588.43
$-\ 55.51$
1532.92

$A = 1532.92\left(1+\frac{0.186}{365}\right)^{20}$
$A = 1548.62$