Practice Test

FOM 12 Chapter 1 Test   Practice Test   Name:_____

Simple interest: $I = Prt$ $A = P(1 + rt)$ (rate, year)   Compounded Interest: $A = P(1 + i)^n$ → year × period   (rate / period)

You have to use the equations for the first 4 questions

1. Determine how much interest is earned if $8000 is invested at 2.7% per annum **simple interest** for 5 years. [3 marks]

$$I = Prt = \$8000 \times 0.027 \times 5 = \$1080$$

Ans) $1080

2. $600 is invested at 4.5% **simple interest** for 9 months. What is the total worth of the investment? [3 marks]

$$A = P(1 + rt) = \$600\left[1 + 0.045\left(\tfrac{9}{12}\right)\right] =$$

Ans) $620.25

3. Rosa invested $600 at 3.9% **simple interest**. At the investment's maturity, it value was $1302. How long was the money invested? [3 marks]

$$I = \$1302 - 600 = \$720$$

$$I = Prt \qquad 720 = \$600\,(0.039)\,t$$

÷ 600
÷ 0.039

Ans) 30.8 yr

4. Using the formula, determine how much interest is earned on an investment of $5000 at an interest rate of 8% per year, **compounded semi-annually** for 5 years. [4 marks]   period = 2/yr

$$A = P[1 + i]^n = \$5000\left[1 + \frac{0.08}{2}\right]^{(5\times2)} = 7401.22$$

Interest = A − P

Ans) $2401.22

For the following question you can use the graphing calculator's financial program

5. Jade has $30 000 to invest for 5 years. Which investment option will earn more interest? How much more interest? [6 marks]

Option A) 6.2% simple interest $$I = Prt = \$30000\,(0.062)\,(5yr) = \$9300 \ (A)$$
• Option B) 4.2% compound interest, compounded annually

N	I	PV	PMT	FV	P/Y	C/Y	End/Begin
5yr	4.2%	−$30000	0	36851.90	1	1	Begin

Interest = FV − PV = $6851.90 (B)

Opt A more: $9300 − $6851.90

Which option?) A

How much more?) $2448.10

6. Determine the present value of a 10-year CIG with an interest rate of 5.6%, compounded monthly, if the future value is $10 000. [2 marks]

N	I	PV	PMT	FV	P/Y	C/Y	End/Begin
10yr	5.6	↳ −5719.54	Ø	$10000	1	12	Begin

Ans) $5719.54

PV (one time)

7. Determine the interest earned on a 20-year investment with an interest rate of 4.25%, compounded quarterly, if the future value is $100 000. [3 marks]

N (year)	I	PV	PMT	FV	P/Y	C/Y	End/Begin
20	4.25%	↓	Ø	$100,000	1	4	Begin

$42,933.57

Interest = FV − PV = 100,000 − 42,933.57 → Ans) $57,066.43

8. Determine the term (in years) of a $26 000 investment with an interest rate of 2.95%, compounded monthly, if the future value is $100 000. [2 marks]

N	I	PV	PMT	FV	P/Y	C/Y	End/Begin
45.7	2.95%	−26000	0	100,000	1	12	Begin

Ans) __45.7 yr__

9. Use the rule of 72 to determine the approximately how long it take for an investment to double in value if the interest rate is 6% compounded semi-annually. [2 marks]

Time to double = $\frac{72}{6\%}$ = 12yr

Ans) __12 yr__

10. If you invest $1000 at the end of each month at 8.5% per annum compounded monthly, how much do you have after 5 years? What was your rate of return? [4 marks]

PMT   P/Y=12   I   C/Y = 12

N (payments)	I	PV	PMT	FV	P/Y	C/Y	End/Begin
5yr×12=60	8.5	Ø	−$1000	)	12	12	End

Total Investment = $1000 × 60 times = $60,000 $74442.44   14,442.44

FV = $74,442.44

Interest = FV − Total Invested = $14,442.44

Rate of Return = $\frac{\text{Interest}}{\text{Investment}}$ ↖ 60,000

Interest earned) __$14,442.44__

Rate of return) __24%__

11. How much would you need to invest each month at 5.75%, compounded quarterly, in order to have saved $12,000 by the end of 7 years? [2 marks]

N 7yr×12	I	PV	PMT	FV	P/Y	C/Y	End/Begin
84	5.75%	Ø	−116.48	12000	12	4	End

Ans) __$116.48__

12. Regular weekly payments of $20 are deposited into an account paying 1.5% interest, compounded weekly. If the final value of the account is $5000, how long was the money invested (in years)?

P/Y = 52   PMT

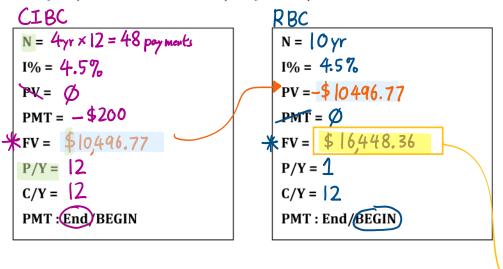| N	I	PV	PMT	FV	P/Y	C/Y	End/Begin
	1.5	Ø	−$20	$5000	52 weekly	52	End

241.43 weeks

÷52 → 4.6 yr

Ans) __4.6 yr__

13. This portfolio was started 2 years ago. What is the **TOTAL** current value of the portfolio?
   - Weekly deposits of $50 (end) into an account earning 2.5%, compounded weekly
   - A $2500 investment averaging 3.25%, compounded semi-annually [4 marks]

N 2×52	I	PV	PMT	FV	P/Y	C/Y	End/Begin
104	2.5%	0	−$50	5330.88	52	52	End

N	I	PV	PMT	FV	P/Y	C/Y	End/Begin
2yr	3.25	−2500	0	2666.50	1	2	Begin

Totl = $2666.50 + $5330.88

Ans) $7997.38

CIBC

14. Diane invested $200 at the end of each month for 4 years at 4.5% per annum compounded monthly. At the end of 4 years she stops making monthly payments, but lets the balance continue to grow in the same investment for another 10 years. How much does she have at the end of 14 years? *(hint: how much did she save after 4 year? Reinvest that as one lump sum for the 2nd part and how much did she save at the end?)* [4 marks]

CIBC
N = 4yr × 12 = 48 payments
I% = 4.5%
PV = Ø
PMT = −$200
*FV = $10,496.77
P/Y = 12
C/Y = 12
PMT : (End)/BEGIN

RBC
N = 10yr
I% = 4.5%
PV = −$10496.77
PMT = Ø
*FV = $16,448.36
P/Y = 1
C/Y = 12
PMT : End/(BEGIN)

Value at the end of 14 years) $16,448.36