Tutorial (Answer Scheme)

Chapter 4 : Compound Interest

1) How much would you need to invest now, to get RM10 000 in 10 years at 8% compounded every months. (3 marks)

$$S = P(1+i)^n$$
$$10{,}000 = P\left(1+\frac{0.08}{12}\right)^{12(10)}$$
$$P = RM4{,}505.23$$

2) What is the interest rate compounded monthly that will make RM1000 become RM2000 in five years? (3 marks)

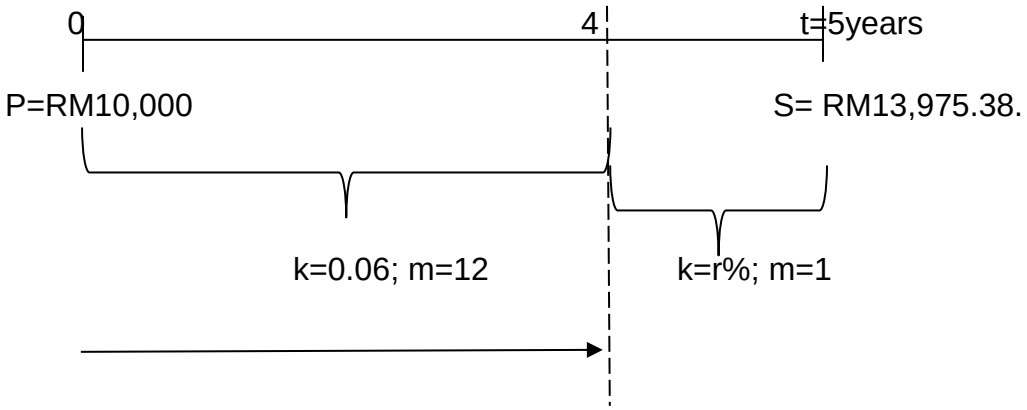
$$S = P(1+i)^n$$
$$2{,}000 = 1{,}000\left(1+\frac{k}{12}\right)^{12(5)}$$
$$2, = \left(1+\frac{k}{12}\right)^{60}$$
$$2^{\left[\frac{1}{60}\right]} = \left(1+\frac{k}{12}\right)$$
$$13.94\% = k$$

3) How long does it take a sum of money to double itself at 14% compounded annually?

(4 marks)

$$S = P(1+i)^n$$
$$2P = P\left(1+\frac{0.14}{1}\right)^{1(t)}$$
$$2 = 1.14^t$$
$$\log 2 = t \log 1.14$$
$$5.29 \text{ years} = t$$

4) RM10,000 was invested for 5 years. The bank offered 6% compounded monthly for the first four years and r% compounded annually for the rest of the period. If the amount in the account at the end of 5 years was RM13,975.38. Find r. (6 marks)



$$S = 10{,}000\left(1+\frac{0.06}{12}\right)^{12(4)}$$
$$= \text{RM}12{,}704.89$$

$$13{,}975.38 = 12{,}704.89(1+r)$$
$$10\% = r$$

5) RM10,000 was invested into an account at an interest rate of 6% compounded every 3 months.

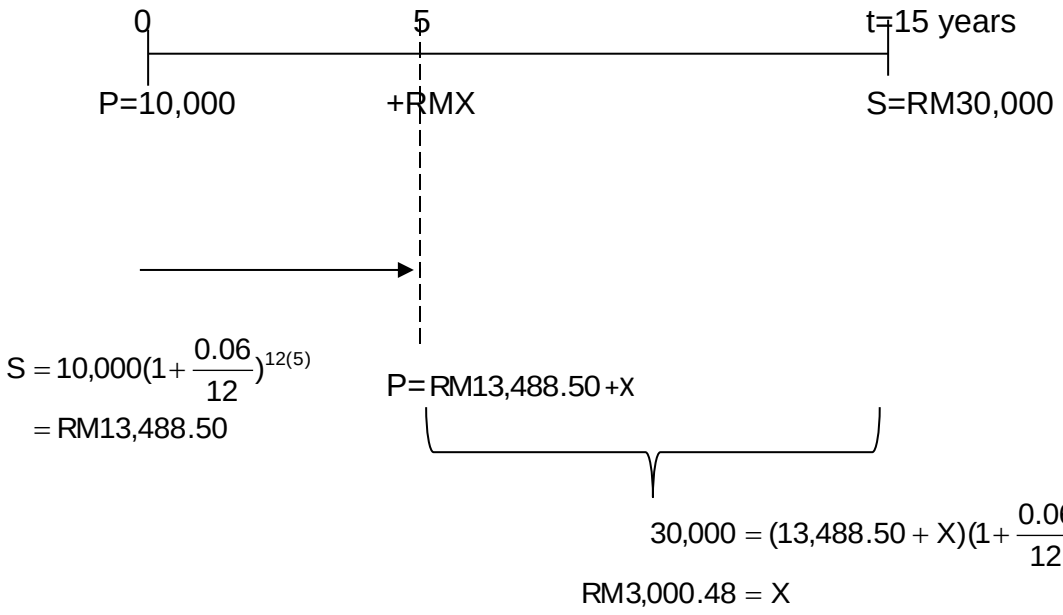
a) Find the amount at the end of 2 years. (3 marks)

$$S = 10{,}000\left(1+\frac{0.06}{4}\right)^{4(2)}$$
$$= \text{RM}11{,}264.93$$

b) After 2 years, the bank increase its interest rate to 8% compounded every 3 months. Find the amount in the account at the end of 5 years of investment. (3 marks)

$$S = 11{,}264.93\left(1+\frac{0.08}{4}\right)^{4(3)}$$
$$= \text{RM}14{,}286.65$$

6) Five years ago, Ali deposited RM10,000 into an account that pays 6% compounded monthly. Today he plans to add RMX into the account. Find the value of X if he plans to have RM30,000 in the account 10 years from today. (6 marks)



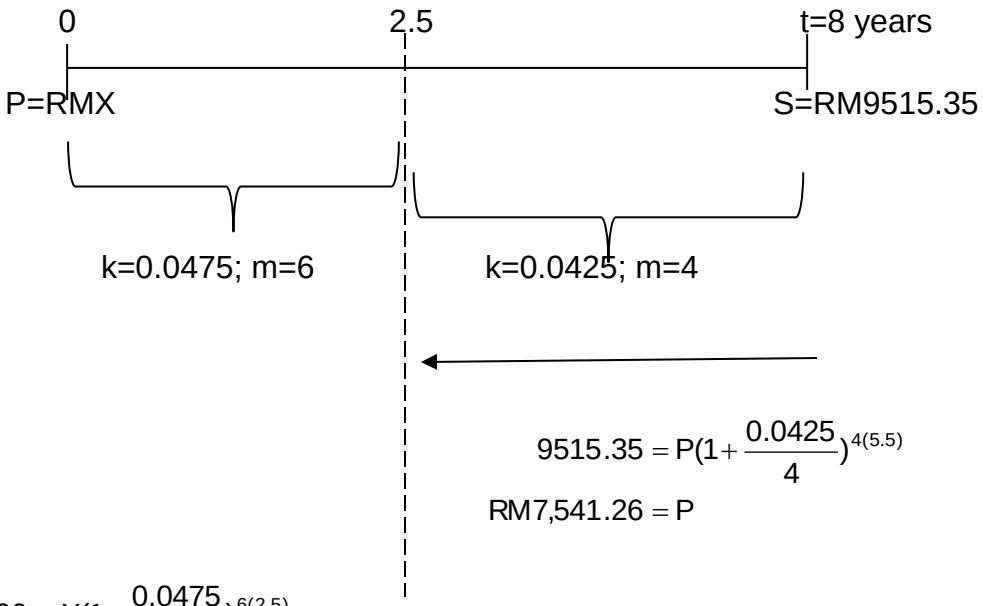
$$S = 10{,}000(1+\frac{0.06}{12})^{12(5)}$$
$$= RM13{,}488.50$$

$$P = RM13{,}488.50 + X$$

$$30{,}000 = (13{,}488.50 + X)(1+\frac{0.06}{12})^{12(10)}$$

$$RM3{,}000.48 = X$$

7) Aina deposited RMX into a saving account for 8 years. The interest rate is 4.75% compounded every 2 months for the first 2.5 years and 4.25% compounded quarterly for the rest of the period. If the accumulated amount in the saving account at the end of 8 years is RM9,515.35. Find the value of X. (6 marks)



$$9515.35 = P(1+\frac{0.0425}{4})^{4(5.5)}$$

$$RM7{,}541.26 = P$$

$$7{,}541.26 = X(1+\frac{0.0475}{6})^{6(2.5)}$$

$$RM6{,}700 = P$$