

Self-exercise 10

1. Factorize the following quadratic. Then, solve the quadratic equations

A=1

a) $x^2 - 16x + 63$

$$= (x-7)(x-9)$$

Good - 12/1/18

$$A=1, B=16, C=63$$

$$AC = 1(63)$$

$$\begin{array}{l} -1 \times -63 \\ -3 \times -21 \\ -7 \times -9 \end{array}$$

$$(x-7)(x-9) = 0$$

A=1

b) $2b^2 + 17b + 21$

$$A=2, B=17, C=21$$

$$AC = 42$$

$$\begin{array}{l} +1 \times 42 \\ +2 \times 21 \\ +3 \times 14 \\ +6 \times 7 \\ +7 \times 6 \end{array}$$

$$2b^2 + 3b + 14b + 21 = 0$$

$$(2b^2 + 3b) + (14b + 21) = 0$$

$$b(2b+3) + 7(2b+3) = 0$$

$$(b+7)(2b+3) = 0$$

$$b+7$$

$$2b+3 = 0$$

$$b+7-7 = 0-7$$

$$0 = 2b+3-3 = 0-3$$

$$b = -7$$

$$\frac{2b}{2} = \frac{-3}{2}$$

$$b = \frac{-3}{2}$$

c) $7x^2 - 31x - 20$

$$A=7, B=31, C=-20$$

$$AC = 140$$

$$\begin{array}{l} +1 \times -140 \\ +2 \times -70 \\ +4 \times -35 \\ +5 \times -28 \\ +7 \times -20 \end{array}$$

$$7x^2 + 4x - 35x - 20 = 0$$

$$(7x^2 + 4x) - (35x - 20) = 0$$

$$x(7x+4) - 5(7x-4) = 0$$

$$(x-5)(7x+4) = 0$$

$$x-5 = 0$$

$$x-5+5 = 0+5$$

$$x = 5$$

$$7x+4 = 0$$

$$7x+4-4 = 0-4$$

$$\frac{7x}{7} = \frac{-4}{7}$$

$$x = -\frac{4}{7}$$

$$d) 9x^2 - 9x - 10$$

$$A=9, B=9, C=10$$

$$AC=90$$

$$\begin{array}{r} +1 \times -90 \\ +2 \times -45 \\ +3 \times -30 \\ +5 \times -18 \\ +6 \times -15 \\ +9 \times -10 \end{array}$$

$$(x+6)(x-15)=0$$

$$9x^2 + 6x - 15x - 10 = 0$$

$$(9x^2 + 6x) - (15x - 10) = 0$$

$$3x(3x+2) - 5(3x+2) = 0$$

$$(3x-5)(3x+2) = 0$$

$$e) 7x^2 - 49x - 28$$

$$A=7, B=49, C=28$$

$$AC=196$$

$$\begin{array}{r} +1 \times -196 \\ +2 \times -98 \\ +4 \times -49 \\ +7 \times -28 \end{array}$$

$$(x+4)(x+49)=0$$

$$7x^2 + 4x - 49x - 28 = 0$$

$$(7x^2 + 4x) - (49x - 28) = 0$$

$$x(7x+4) - 7(7x+4) = 0$$

$$(x-7)(7x+4) = 0$$

$$3x-5=0$$

$$\text{or } 3x+2=0$$

$$3x-5+5=0+5 \quad 3x+2-2=0-2$$

$$\frac{3x}{3} = \frac{5}{3}$$

$$\frac{3x}{3} = \frac{-2}{3}$$

$$x = \frac{5}{3}$$

$$x = \frac{-2}{3}$$

$$x-7=0$$

$$x-7+7=0+7$$

$$x=7$$

$$7x+4=0$$

$$7x+4-4=0-4$$

$$\frac{7x}{7} = \frac{-4}{7}$$

$$x = \frac{-4}{7}$$

2. Find the Simple interest and total ending amount for each of the following.

$$a) P = \text{RM}1800, R = 5\%, T = 3 \text{ years.}$$

$$I = \frac{1800 \times 5 \times 3}{100}$$

$$= 270$$

$$\text{Total} = 1800 + 270$$

$$= \text{RM} 2070$$

$$b) P = \text{RM} 5660, R = 11\%, T = 9 \text{ months}$$

$$I = \frac{5660 \times 11 \times 9}{12}$$

$$100$$

$$= 466.95$$

$$\text{Total} = 5660 + 466.95$$

3. Find the total value of the investment after the time given.

a) RM 1500 at 7% compounded annually for 3 years.

$$\text{Year 1} = 1500 \times 7\% = 105$$

$$\text{Year 1} = 1605 \times 7\% = 112.35$$

$$\text{Year 3} = 1717.35 \times 7\% = 120.21$$

$$\underline{337.56}$$

$$1500 + 337.56 = \text{RM } 1837.56$$

$$A = 1500 (1 + 0.07)^3$$

$$= 1500 (1.07)^3$$

$$= \text{RM } 1837.56$$

b) RM 1240 at 8% compounded annually for 2 years.

$$\text{Year 1} = 1240 \times 8\% = 99.2$$

$$\text{Year 2} = 1339.2 \times 8\% = 107.136$$

$$\underline{206.336}$$

$$1240 + 206.336 = \text{RM } 1446.36$$

$$A = 1240 (1 + 0.08)^2$$

$$= 1240 (1.08)^2$$

$$= \text{RM } 1446.36$$

4. You wish to receive an annuity of RM 800 each year for 5 years. The annual interest rate is 10%. What is the present value of annuity? [Answer: RM 3032.63]

$$800 \div 1.10 = 727.27$$

$$800 \div 1.10 \div 1.10 = 661.16$$

$$800 \div 1.10 \div 1.10 \div 1.10 = 601.05$$

$$800 \div 1.10 \div 1.10 \div 1.10 \div 1.10 = 546.41$$

$$= \text{RM } 3032.63$$

$$800 \div 1.10 \div 1.10 \div 1.10 \div 1.10 \div 1.10 = 496.74$$

$$\underline{3032.63}$$

5. You wish to receive an annuity of RM300 a month for 6 year. The annual interest rate is 0.9%. What is the present value of the annuity?

[Answer: RM 15,846.35]

$$300 \times \frac{1 - (1 + 0.009)^{-72}}{0.009}$$

$$= \text{RM } 15,846.35$$