

Penyelesaian Lengkap

PRAKTIS 1

Praktis Formatif

1.1 Fungsi dan Persamaan Kuadratik Quadratic Functions and Equations

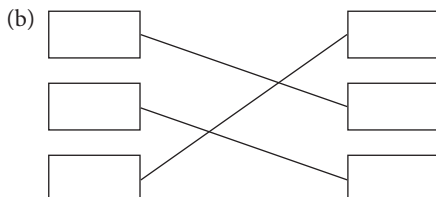
1 (a)

	Ungkapan Expression	Kuasa pemboleh ubah tertinggi = 2 Highest power of the variable = 2 (✓ / ✗)	Bilangan pemboleh ubah = 1 Number of variable = 1 (✓ / ✗)	Adakah terdapat kuasa pemboleh ubah yang bukan nombor bulat? (Ya/Tidak) Is there a power of variable which is not a whole number? (Yes/No)	Ungkapan kuadratik dalam satu pemboleh ubah (Ya/Bukan) Quadratic expression in one variable (Yes/No)
(i)	$v^3 - \frac{v}{5}$	✗	✓	Tidak/No	Bukan/No
(ii)	$\frac{a^2}{36}$	✓	✓	Tidak/No	Ya/Yes
(iii)	$b - d^2$	✓	✗	Tidak/No	Bukan/No
(iv)	$7y^2 + 2y + 4$	✗	✓	Ya/Yes	Bukan/No
(v)	$\frac{\sqrt{49m^4}}{5} - \sqrt{2}$	✓	✓	Tidak/No	Ya/Yes
(vi)	$8p - p^3$	✗	✓	Tidak/No	Bukan/No
(vii)	$r - 9$	✗	✓	Tidak/No	Bukan/No
(viii)	$0.5f(2f + 15)$	✓	✓	Tidak/No	Ya/Yes
(ix)	$e^2 + e^{\sqrt{5}}$	✓	✓	Ya/Yes	Bukan/No

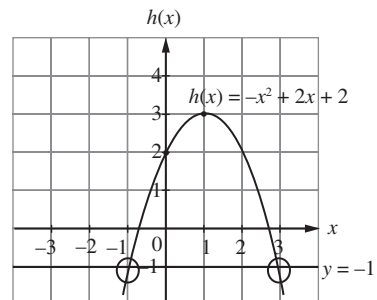
- (b) (i) x (iii) -2
(ii) 4 (iv) $7t$

2 (a)

Ungkapan kuadratik Quadratic expression	a	b	c
(i) $g^2 - 1$	1	0	-1
(ii) $(4q) + (1)q^2$	1	4	0
(iii) $-2f - 8f^2 + 3$	-8	-2	3
(iv) $(-7)y^2 - (5)y - (2)$	-7	$-\frac{10}{2}$	-2
(v) $1 + e + 9e^2$	9	1	1



3 (a) (i), (ii)



(iii) Fungsi kuadratik mempunyai hubungan banyak kepada satu.

A quadratic function has many-to-one relation.

(b) (1, 3)

- 4 (a) (i) $a > 0, b > 0, c > 0$
(ii) $a < 0, b > 0, c < 0$
(iii) $a < 0, b < 0, c > 0$
(iv) $a > 0, b < 0, c < 0$

(b) (i) paksi simetri/axis of symmetry

$$(ii) x = -\frac{b}{2a}$$

(c) pintasan-y/y-intercept

(d) D ialah titik minimum dan E ialah titik maksimum.

D is a minimum point and E is a maximum point.

5 a bagi/for $p(x) = 1$

a bagi/for $q(x) = 2$

a bagi/for $r(x) = -1$

a bagi/for $s(x) = -2$

6 (a) $x = -1$

(b) $(-1, 9)$

(c) $x = -4$ atau/or $x = 2$

$$(d) y = -(x+4)(x-2) \\ = -x^2 - 2x + 8$$

$$\therefore a = -1, b = -2, c = 8$$

7 (a) $p = 1$

$$(b) 9 = q + 4(2) - (1)(2)^2$$

$$q = 5$$

(c) Jika graf itu dipantulkan pada paksi-x, graf berbentuk minimum akan diperoleh.

When the graph is reflected in the x-axis, a minimum graph will be obtained.

$$f(x) = -(-x^2 + 4x + 5)$$

$$f(x) = x^2 - 4x - 5$$

(d) Nilai a dan c akan kekal tidak berubah dan nilai b akan bertukar tanda daripada positif kepada negatif dan sebaliknya.

The values of a and c remain unchanged and the value of b will change sign from positive to negative and vice versa.

8 (a) $f(x) = \frac{1}{2}(2x+5)(4x-9)$

(b) $f(x) = \frac{1}{2}(2x+5)(4x-9) = 16.5$

$$(2x+5)(4x-9) = 33$$

$$8x^2 + 2x - 45 = 33$$

$$8x^2 + 2x - 78 = 0$$

$$4x^2 + x - 39 = 0$$

9 (a) $f(x) = (x+2)(x-6)$

(b) $f(x) = (x+2)(x-6) = 2x+4$

$$x^2 - 4x - 12 = 2x + 4$$

$$x^2 - 6x - 16 = 0$$

10 (a) Umur Azmi sekarang/Azmi's age now = x

Umur Amran sekarang/Amran's age now = $x + 3$

5 tahun yang lepas/5 years ago:

Umur Azmi /Azmi's age = $x - 5$

Umur Amran/Amran's age = $x - 2$

$$f(x) = (x-5)(x-2)$$

$$f(x) = x^2 - 7x + 10$$

(b) $f(x) = x^2 - 7x + 10 = 40$

$$x^2 - 7x - 30 = 0$$

11 $x^2 + (x-7)^2 = (x+1)^2$

$$x^2 + x^2 - 14x + 49 = x^2 + 2x + 1$$

$$x^2 - 16x + 48 = 0$$

12 (a) $V(w) = 5w(w+3)$ atau/or $5w^2 + 15w$

(b) $5w^2 + 15w = 90$

$$w^2 + 3w - 18 = 0$$

13 (a) $h(x) = x(x-5) + (3x+4)(x-7)$

$$= x^2 - 5x + 3x^2 - 21x + 4x - 28$$

$$= 4x^2 - 22x - 28$$

(b) $4x^2 - 22x - 28 = 52$

$$4x^2 - 22x - 80 = 0$$

$$2x^2 - 11x - 40 = 0$$

14 (a) $(-4)^2 + 3(-4) - 4 = 16 - 12 - 4$

$$= 0 = (\text{Sebelah kanan/Right hand side})$$

Maka, $x = -4$ memuaskan persamaan kuadratik itu. $x = -4$ ialah puncanya.

Therefore, $x = -4$ satisfies the quadratic equation.

$x = -4$ is its root.

(b) $(-1)^2 + 3(-1) - 4 = 1 - 3 - 4$

$$= -6 \neq (\text{Sebelah kanan/Right hand side})$$

Maka, $x = -1$ tidak memuaskan persamaan kuadratik itu. $x = -1$ bukan puncanya.

Therefore, $x = -1$ does not satisfy the quadratic equation. $x = -1$ is not its root.

(c) $(1)^2 + 3(1) - 4 = 1 + 3 - 4$

$$= 0 = (\text{Sebelah kanan/Right hand side})$$

Maka, $x = 1$ memuaskan persamaan kuadratik itu. $x = 1$ ialah puncanya.

Therefore, $x = 1$ satisfies the quadratic equation.

$x = 1$ is its root.

15 (a) Sebelah kiri/Left hand side = $(-1)^2 - 2(-1)$

$$= 3$$

$$= \text{Sebelah kanan/Right hand side}$$

Maka, $x = -1$ memuaskan persamaan kuadratik itu. $x = -1$ ialah puncanya.

Therefore, $x = -1$ satisfies the quadratic equation.

$x = -1$ is its root.

(b) Sebelah kiri/Left hand side = $(1)^2 - 2(1)$

$$= -1$$

$$\neq \text{Sebelah kanan/Right hand side}$$

Maka, $x = 1$ tidak memuaskan persamaan kuadratik itu. $x = 1$ bukan puncanya.

Therefore, $x = 1$ does not satisfy the quadratic equation. $x = 1$ is not its root.

(c) Sebelah kiri/Left hand side = $(3)^2 - 2(3)$

$$= 3$$

$$= \text{Sebelah kanan/Right hand side}$$

Maka, $x = 3$ memuaskan persamaan kuadratik itu. $x = 3$ ialah puncanya.

Therefore, $x = 3$ satisfies the quadratic equation.

$x = 3$ is its root.

16 Punca-punca bagi persamaan kuadratik ialah pintasan-x, iaitu apabila $f(x) = 0$, maka $x = -2$ atau $x = 3$.

Roots of quadratic equation are the x-intercepts of quadratic function when $f(x) = 0$, therefore, $x = -2$ or $x = 3$.

17 (a) $x = -2, x = 2$

(b) $x = 4, x = 5$

(c) $x = -1, x = 3$

18 (a) Sebab 2 dan 4 memuaskan $f(x) = 0$
Because 2 and 4 satisfy $f(x) = 0$

(b) $(x - 2)$ dan/and $(x - 4)$

(c) $f(x) = (x - 2)(x - 4)$
 $f(x) = x^2 - 6x + 8$

19 (a) $x^2 - 3x = 0$
 $x(x - 3) = 0$
 $x = 0$ atau/or $(x - 3) = 0$
 $x = 0$ atau/or $x = 3$

(b) $x^2 - 2x - 15 = 0$
 $(x + 3)(x - 5) = 0$
 $(x + 3) = 0$ atau/or $(x - 5) = 0$
 $x = -3$ atau/or $x = 5$

(c) $3x^2 + 23x - 8 = 0$
 $(3x - 1)(x + 8) = 0$
 $(3x - 1) = 0$ atau/or $(x + 8) = 0$
 $x = \frac{1}{3}$ atau/or $x = -8$

(d) $4n^2 - 49 = 0$
 $(2n + 7)(2n - 7) = 0$
 $n = -\frac{7}{2}$ atau/or $n = \frac{7}{2}$

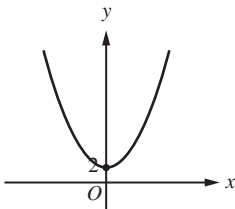
(e) $3n^2 = 10n - 8$
 $3n^2 - 10n + 8 = 0$
 $(3n - 4)(n - 2) = 0$
 $n = \frac{4}{3}$ atau/or $n = 2$

Tulis dalam bentuk am dahulu.
Write in general form first.

(f) $27n^2 = 24 - 18n$
 $27n^2 + 18n - 24 = 0$
 $9n^2 + 6n - 8 = 0$
 $(3n + 4)(3n - 2) = 0$
 $n = -\frac{4}{3}$ atau/or $n = \frac{2}{3}$

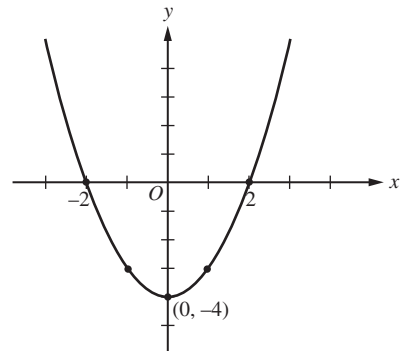
Bahagi dengan faktor sepunya.
Divide with common factor.

20 (a) $f(x) = x^2 + 2$
Nilai/value of $a = 1$, bentuk graf /shape \cup ,
Nilai/value of $b = 0$, paksi simetri ialah paksi-y/axis
of symmetry is y-axis.
Nilai/value of $c = 2$, pintasan-y/y-intercept = 2
Maka, titik minimum ialah $(0, 2)$.
Therefore, the minimum point is $(0, 2)$.

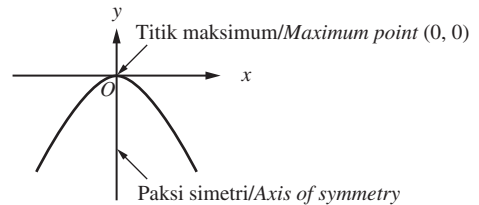


(b) $f(x) = x^2 - 4$
Nilai/value of $a = 1$, bentuk graf /shape \cup ,
Nilai/value of $b = 0$, paksi simetri ialah paksi-y/axis
of symmetry is y-axis.
Nilai/value of $c = -4$, pintasan-y/y-intercept = -4
Maka, titik minimum ialah $(0, -4)$.
Therefore, the minimum point is $(0, -4)$.
Apabila/when $f(x) = 0$
 $x^2 - 4 = 0$
 $(x + 2)(x - 2) = 0$

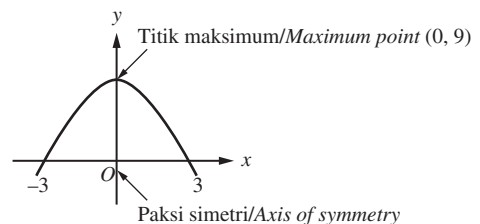
$x = -2$ atau/or $x = 2$



(c) $f(x) = -x^2$
Nilai/value of $a = -1$, bentuk graf/shape \cap ,
Nilai/value of $b = 0$, paksi simetri ialah paksi-y/axis
of symmetry is y-axis.
Nilai/value of $c = 0$, pintasan-y/y-intercept = 0
Maka, titik maksimum ialah $(0, 0)$.
Therefore, the maximum point is $(0, 0)$.



(d) $f(x) = -x^2 + 9$
Nilai/value of $a = -1$, bentuk graf/shape \cap ,
Nilai/value of $b = 0$, paksi simetri ialah paksi-y/axis
of symmetry is y-axis.
Nilai/value of $c = 9$, pintasan-y/y-intercept = 9
Maka, titik maksimum ialah $(0, 9)$.
Therefore, the maximum point is $(0, 9)$.
Apabila/when $f(x) = 0$
 $9 - x^2 = 0$
 $(3 + x)(3 - x) = 0$
 $x = -3$ atau/or $x = 3$

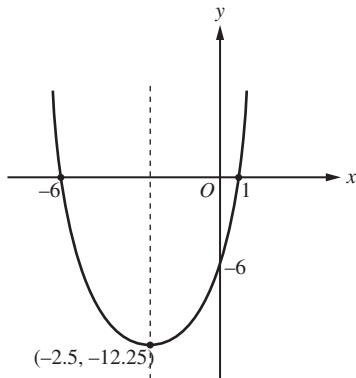


(e) $f(x) = x^2 + 5x - 6$
Nilai/value of $a = 1$, bentuk graf /shape \cup ,
Nilai/value of $b = 5$, paksi simetri ialah/axis of
symmetry is $x = -\frac{b}{2a} = -\frac{5}{2(1)} = -2.5$
Nilai/value of $c = -6$, pintasan-y/y-intercept = -6
Apabila/When $f(x) = 0$
 $x^2 + 5x - 6 = 0$
 $(x + 6)(x - 1) = 0$
 $x = -6$ atau/or $x = 1$

Apabila/When $x = -2.5$, $y = (-2.5)^2 + 5(-2.5) - 6 = -12.25$

Maka, titik minimum ialah $(-2.5, -12.25)$.

Therefore, the minimum point is $(-2.5, -12.25)$.



(f) $f(x) = x^2 - x - 2$

Nilai/value of $a = 1$, bentuk graf /shape \cup ,

Nilai/value of $b = -1$, paksi simetri ialah/axis of

symmetry is $x = -\frac{b}{2a} = -\frac{-1}{2(1)} = 0.5$

Nilai/value of $c = -2$, pintasan-y/y-intercept = -2

Apabila/when $f(x) = 0$

$$x^2 - x - 2 = 0$$

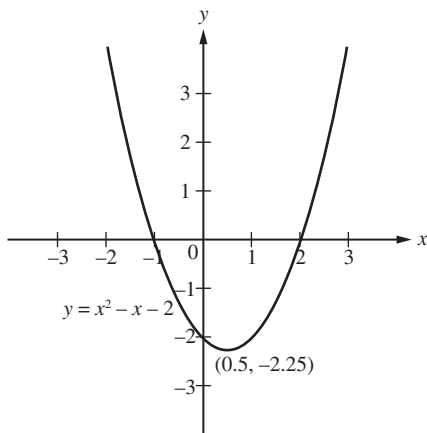
$$(x + 1)(x - 2) = 0$$

$x = -1$ atau/or $x = 2$

Apabila/When $x = 0.5$, $y = (0.5)^2 - (0.5) - 2 = -2.25$

Maka, titik minimum ialah $(0.5, -2.25)$.

Therefore, the minimum point is $(0.5, -2.25)$.



(g) $f(x) = -x^2 - 2x + 15$

Nilai/value of $a = -1$, bentuk graf /shape \cap ,

Nilai/value of $b = -2$, paksi simetri ialah/axis of

symmetry is $x = -\frac{b}{2a} = -\frac{-2}{2(-1)} = -1$

Nilai/value of $c = 15$, pintasan-y/y-intercept = 15

Apabila/When $f(x) = 0$

$$x^2 + 2x - 15 = 0$$

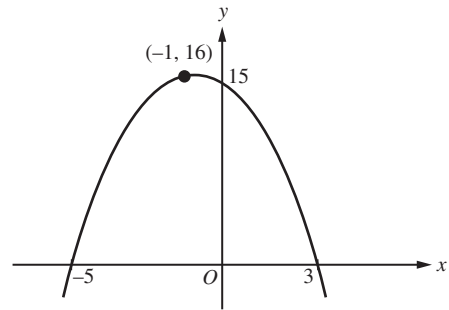
$$(x + 5)(x - 3) = 0$$

$x = -5$ atau/or $x = 3$

Apabila/When $x = -1$, $y = -(-1)^2 - 2(-1) + 15 = 16$

Maka, titik maksimum ialah $(-1, 16)$.

Therefore, the maximum point is $(-1, 16)$.



(h) $f(x) = -2x^2 - 4x + 6$

Nilai/value of $a = -2$, bentuk graf /shape \cap ,

Nilai/value of $b = -4$, paksi simetri ialah/axis of

symmetry is $x = -\frac{b}{2a} = -\frac{-4}{2(-2)} = -1$

Nilai/value of $c = 6$, pintasan-y/y-intercept = 6

Apabila/When $f(x) = 0$

$$-2x^2 - 4x + 6 = 0$$

$$x^2 + 2x - 3 = 0$$

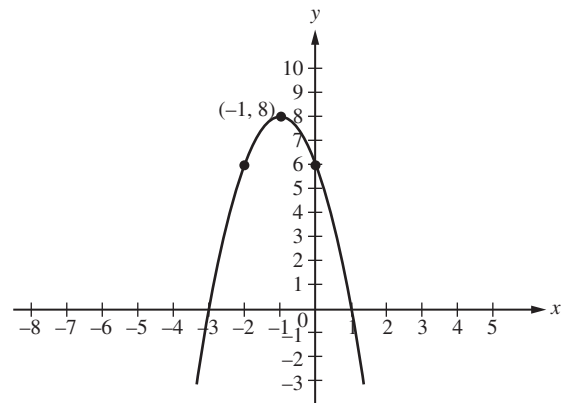
$$(x + 3)(x - 1) = 0$$

$x = -3$ atau/or $x = 1$

Apabila/When $x = -1$, $y = -2(-1)^2 - 4(-1) + 6 = 8$

Maka, titik maksimum ialah $(-1, 8)$.

Therefore, the maximum point is $(-1, 8)$.



21 (a) $x^2 - \frac{5}{2}x = \frac{3}{2}$

$$2x^2 - 5x - 3 = 0$$

$$(2x + 1)(x - 3) = 0$$

$x = -\frac{1}{2}$ atau/or $x = 3$

(b) $\frac{1}{16}a^2 - 25 = 0$

$$\left(\frac{1}{4}a - 5\right)\left(\frac{1}{4}a + 5\right) = 0$$

$a = 20$ atau/or $a = -20$

(c) $6h^2 - 19h = -15$

$$6h^2 - 19h + 15 = 0$$

$$(2h - 3)(3h - 5) = 0$$

$h = \frac{3}{2}$ atau/or $h = \frac{5}{3}$

$$(d) \quad 8q^2 + 18q - 5 = 0$$

$$(4q - 1)(2q + 5) = 0$$

$$q = \frac{1}{4} \text{ atau/or } q = -\frac{5}{2}$$

$$(e) \quad m + 5 = \frac{6}{m}$$

$$m^2 + 5m - 6 = 0$$

$$(m - 1)(m + 6) = 0$$

$$m = 1 \text{ atau/or } m = -6$$

$$(f) \quad r + 2 = \frac{28}{r - 1}$$

$$(r + 2)(r - 1) = 28$$

$$r^2 + r - 30 = 0$$

$$(r + 6)(r - 5) = 0$$

$$r = -6 \text{ atau/or } r = 5$$

$$(g) \quad k - 1 = \frac{(k + 20)}{6k}$$

$$6k(k - 1) = k + 20$$

$$6k^2 - 7k - 20 = 0$$

$$(2k - 5)(3k + 4) = 0$$

$$k = \frac{5}{2} \text{ atau/or } k = -\frac{4}{3}$$

$$(h) \quad n(n - 5) = 6$$

$$n^2 - 5n - 6 = 0$$

$$(n + 1)(n - 6) = 0$$

$$n = -1 \text{ atau/or } n = 6$$

$$(i) \quad \frac{(h^2 - 1)}{5} - \frac{h}{6} = 0$$

$$6(h^2 - 1) - 5h = 0$$

$$6h^2 - 5h - 6 = 0$$

$$(3h + 2)(2h - 3) = 0$$

$$h = -\frac{2}{3} \text{ atau/or } h = \frac{3}{2}$$

$$22 (a) \quad \frac{1}{2}x(x - 3) = 54$$

$$x^2 - 3x - 108 = 0$$

$$(b) \quad (x - 12)(x + 9) = 0$$

$$x = 12$$

$$(c) \text{ Tinggi/Height} = 12 - 3 = 9 \text{ cm}$$

$$23 (a) \quad x(110 - x) = 3\,000$$

$$x^2 - 110x + 3\,000 = 0$$

$$(b) \quad (x - 50)(x - 60) = 0$$

$$x = 50 \text{ atau/or } x = 60$$

$$(c) \text{ Panjang/Length} = 60 \text{ cm, Lebar/Width} = 50 \text{ cm}$$

$$24 (a) \quad \frac{120}{(x - 2)} - \frac{120}{x} = 5$$

$$120x - 120x + 240 = 5x^2 - 10x$$

$$5x^2 - 10x - 240 = 0$$

$$x^2 - 2x - 48 = 0$$

$$(b) \quad (x + 6)(x - 8) = 0$$

$$x = 8$$

$$(c) \text{ Apabila/When } x = 8,$$

$$\text{bayaran setiap orang/payment of each person}$$

$$= \frac{\text{RM120}}{8} = \text{RM15}$$

jimat/save RM3, setiap orang bayar/each of them

pay RM12, maka/therefore

$$\frac{\text{RM120}}{\text{RM12}} = 10$$

$$n = 10 - 8$$

$$= 2 \text{ orang lagi/more persons}$$

$$25 (a) \quad \frac{1}{2}[2t + 1 + 4t - 2](3t) = 138$$

$$(6t - 1)3t = 276$$

$$18t^2 - 3t - 276 = 0$$

$$6t^2 - t - 92 = 0$$

$$(b) \quad (6t + 23)(t - 4) = 0$$

$$t = 4$$

$$(c) \text{ Panjang tepi sendeng/the length of slanting edge}$$

$$= \sqrt{(5^2 + 12^2)} = 13 \text{ cm}$$

$$\text{Perimeter} = 2(4) + 1 + 3(4) + 4(4) - 2 + 13$$

$$= 48 \text{ cm}$$

$$26 (a) \quad x(x + 8) = 209$$

$$x^2 + 8x - 209 = 0$$

$$(b) \quad (x - 11)(x + 19) = 0$$

$$x = 11$$

$$(c) \text{ Perimeter} = [11 + (8 + 11)] \times 2 = 60 \text{ cm}$$

$$27 (a) \quad \frac{120}{v} - \frac{120}{v + 20} = \frac{1}{2}$$

$$240(v + 20) - 240v = v(v + 20)$$

$$v^2 + 20v - 4\,800 = 0$$

$$(b) \quad (v - 60)(v + 80) = 0$$

$$v = 60$$

Praktis Sumatif

Kertas 1

1 C	2 A	3 D	4 A	5 A
6 B	7 C	8 B	9 B	

Kertas 2

Bahagian/Section A

$$1 (a) \quad v = 3 + 2t - t^2$$

Apabila/When $v = 0$

$$3 + 2t - t^2 = 0$$

$$t^2 - 2t - 3 = 0$$

$$(t + 1)(t - 3) = 0$$

$$t = 3 \text{ s}$$

$$(b) \text{ Apabila/When } v = 3$$

$$3 + 2t - t^2 = 3$$

$$2t - t^2 = 0$$

$$t(2 - t) = 0$$

$$t = 0 \text{ s or } t = 2 \text{ s}$$

$$(c) \text{ Paksi simetri/Axis of symmetry is } t = -\frac{b}{2a}$$

$$= -\frac{2}{2(-1)}$$

$$= 1 \text{ s}$$

$$2 \quad 36x(x - 2) = 1\,728$$

$$36x^2 - 72x - 1\,728 = 0$$

$$x^2 - 2x - 48 = 0$$

$$(x - 8)(x + 6) = 0$$

$$x = 8$$

3 (a) $x = \frac{-2 + 8}{2}$

$x = 3$

(b) $f(x) = (x + 2)(x - 8)$
 $= x^2 - 6x - 16$
 $= (x - 3)^2 - 9 - 16$
 $= (x - 3)^2 - 25$

$p = 3, q = 25$

(c) $f(x) = (x - 3)^2 - 25$

Koordinat titik minimum ialah/Coordinates of the minimum point is (3, -25).

Bahagian B/Section B

4 (a) $f(x) = -2x^2 + 9x + 5$
 $= -(2x^2 - 9x - 5)$
 $= -(2x + 1)(x - 5)$
 $-(2x + 1)(x - 5) = 0$

$x = -\frac{1}{2}$ atau/or $x = 5$

(b) 5

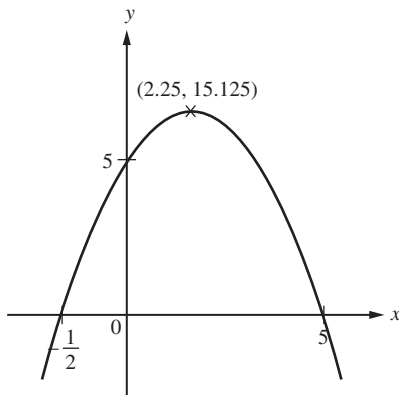
(c) Persamaan paksi simetri ialah $x = \frac{-\frac{1}{2} + 5}{2}$
 $x = 2.25$

Equation of axis of symmetry is $x = \frac{-\frac{1}{2} + 5}{2}$
 $x = 2.25$.

Apabila/When $x = 2.25$,

$y = -2(2.25^2) + 9(2.25) + 5$
 $= 15.125$

Titik maksimum/Maximum point (2.25, 15.125)



5 (a) $(x + 3)(x + 4) = (2x + 2)(x + 1)$
 $x^2 + 7x + 12 = 2x^2 + 4x + 2$
 $x^2 - 3x - 10 = 0$

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

(c) (i) Panjang segi empat tepat A/Length of rectangle A

$= x + 4$

$= 5 + 4$

$= 9 \text{ cm}$

Lebar segi empat tepat A/Width of rectangle A

$= x + 3$

$= 5 + 3$

$= 8 \text{ cm}$

(ii) Panjang segi empat tepat B/Length of rectangle B

$= 2x + 2$

$= 10 + 2$

$= 12 \text{ cm}$

Lebar segi empat tepat B/Width of rectangle B

$= x + 1$

$= 5 + 1$

$= 6 \text{ cm}$

(iii) Perimeter segi empat tepat A/Perimeter of rectangle A

$= 9 + 9 + 8 + 8$

$= 34 \text{ cm}$

Perimeter segi empat tepat B/Perimeter of rectangle B

$= 12 + 12 + 6 + 6$

$= 36 \text{ cm}$

Beza perimeter/Difference between perimeter

$= 36 \text{ cm} - 34 \text{ cm}$

$= 2 \text{ cm}$

6 (a) (i) $a > 0$

(ii) $b < 0$

(iii) $c = 5$

(b) (i) 2

(ii) (1, 2), (3, 2)

(iii) Hubungan banyak kepada satu
Many-to-one relation