

PENYELESAIAN LENGKAP

SET 1

KERTAS 1

- 1 B $246\,800\,000 = 2.468 \times 10^8$
- 2 A $x^2 - 9x + 20 = 0$
 $(x - 4)(x - 5) = 0$
 $x = 4$ atau/ $x = 5$
- 3 C $(x - 4)^2 + 4(x + 1)^2 - 3(x^2 - 2x)$
 $= x^2 - 8x + 16 + 4(x^2 + 2x + 1) - 3x^2 + 6x$
 $= -2x^2 - 2x + 16 + 4x^2 + 8x + 4$
 $= 2x^2 + 6x + 20$
- 4 D $4^{r+3} = 8^2 \times 4^2$
 $(2^2)^{r+3} = (2^3)^2 \times (2^2)^2$
 $2r + 6 = 6 + 4$
 $2r = 4$
 $r = 2$
- 5 A $\left(\frac{2x}{5y^3}\right)^{-2} = \left(\frac{5y^3}{2x}\right)^2$
 $= \frac{25y^6}{4x^2}$
- 6 B $\frac{\sqrt{E+2F}}{3} = \frac{1}{G}$
 $\sqrt{E+2F} = \frac{3}{G}$
 $E + 2F = \frac{9}{G^2}$
 $2F = \frac{9}{G^2} - E$
 $F = \frac{9 - EG^2}{2G^2}$
- 7 D
- 8 C Baki
Remainder
- | | | |
|---|-----|-------|
| 7 | 688 | |
| 7 | 98 | — 2 ↑ |
| 7 | 14 | — 0 |
| 7 | 2 | — 0 |
| | 0 | — 2 |
- $688_{10} = 2(7^3) + 2$
 $a = 2, b = 3, c = 2$
 $ab - c = 2(3) - 2 = 4$
- 9 C $2^5 = 32$
- 10 A $n(P \cap Q) = \frac{1}{7}n(\xi)$
 $5 = \frac{1}{7}(4 + 12 + 4t + 2 + 5)$
 $5 = \frac{1}{7}(23 + 4t)$
 $\frac{4}{7}t = 5 - \frac{23}{7}$
 $\frac{4t}{7} = \frac{12}{7}$
 $t = 3$

- 11 D
- 12 B $\angle ABO = \angle ACO = 90^\circ$
 $x = 360^\circ - 180^\circ - 40^\circ$
 $= 140^\circ$
 $y = \frac{180^\circ - 140^\circ}{2}$
 $z = 70^\circ$
- 13 B
- 14 C
- 15 D Jumlah darjah mestilah nombor genap.
Sum of degrees must be an even number.
- 16 D
- 17 A Nyahpecutan/*Deceleration*
 $= -\frac{16 - 0}{20 - 25}$
 $= 3.2 \text{ m s}^{-2}$
- 18 D Katakan ketinggian trapezium ialah h .
Let the height of the trapezium be h .
 $0.5 \times 14 \times h = 84$
 $h = 12$
 $ED = \sqrt{13^2 - 12^2}$
 $= 5 \text{ cm}$
Luas kawasan $ABDF$ /*Area of ABDF*
 $= [0.5 \times (18 + 13) \times 12]$
 $= 186 \text{ cm}^2$
- 19 A $y = \frac{-5 - 4}{-1 - 5}x + c$
 $y = \frac{3}{2}x + c$
Pada titik $(5, 4)$,
At the point $(5, 4)$,
 $4 = \frac{3}{2}(5) + c$
 $c = -\frac{7}{2}$
 $y = \frac{3}{2}x - \frac{7}{2}$
 $2y = 3x - 7$
- 20 C $f(x) = x^2 - 8x + 16$
 $= (x - 4)^2$
Nilai $a = 1 > 0$, bentuk $\cup$
Value of $a = 1 > 0$, shape $\cup$
Apabila/*When* $f(x) = 0$,
 $x^2 - 8x + 16 = 0$
 $(x - 4)^2 = 0$
 $x = 4$
Pintasan- x /*x-intercept* $= 4$
Nilai $c = 16$, pintasan- $y = 16$
Value of $c = 16$, y-intercept $= 16$
- 21 A

22 C

Titik Point	Ketidaksamaan $y > 2x + 1$ Inequality $y > 2x + 1$
(0, 1)	$1 > 2(0) + 1$ (✗)
(1, 0)	$0 > 2(1) + 1$ (✗)
(-1, 2)	$2 > 2(-1) + 1$ (✓)
(1, 3)	$3 > 2(1) + 1$ (✗)

23 B

$\tan \theta = -2.246$
 θ berada di sukuan kedua.
 θ is in the second quadrant.
 $\tan^{-1}(-2.246) = 66$

$$\theta = 180^\circ - 66^\circ$$

$$= 114^\circ$$

24 D

Luas imej = $k^2 \times$ Luas objek
Area of image = $k^2 \times$ Area of object

$$27 = \left(\frac{1}{3}\right)^2 \times \text{Luas objek}$$

$$\text{Area of object}$$

$$\text{Luas objek/Area of object}$$

$$= 27 \times 3^2$$

$$= 243 \text{ cm}^2$$

25 D

Kebarangkalian perempuan yang menunggang basikal
 $= \frac{1}{3}$

$$\text{Probability of girls who ride bicycles} = \frac{1}{3}$$

$$\frac{6+8}{x+6+y+8} = \frac{1}{3}$$

$$\frac{14}{x+y+14} = \frac{1}{3}$$

$$x+y+14 = 42$$

$$x+y = 28$$

$$\frac{\text{Lelaki dari sekolah E}}{\text{Lelaki dari sekolah F}} = \frac{1}{6}$$

$$\frac{\text{Boys from school E}}{\text{Boys from school F}} = \frac{1}{6}$$

$$\frac{y}{x} = \frac{1}{6}$$

$$y = \frac{1}{6}x$$

Gantikan $y = \frac{1}{6}x$ ke dalam $x + y = 28$,

Substitute $y = \frac{1}{6}x$ into $x + y = 28$,

$$x + \frac{1}{6}x = 28$$

$$\frac{7}{6}x = 28$$

$$x = 24$$

26 B

Kebarangkalian memilih huruf konsonan/Probability
choosing a consonant = $\frac{5}{7}$

Katakan n ialah jumlah kad.
Let n be the sum of cards.

$$\frac{5}{7} = \frac{75}{n}$$

$$n = 105$$

$$k = \frac{105}{7}$$

$$= 15$$

27 D

Dua matriks hanya boleh didarab apabila bilangan lajur
matriks pertama sama dengan bilangan baris matriks kedua.
Two matrices can carry out multiplication when the column
of the first matrix is equal to the row of the second matrix.

28 B

$$-p \begin{bmatrix} q & -1 \\ -3 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ r & -2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$-p \begin{bmatrix} q-r & q+2 \\ r-3 & -5 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} -p(q-r) & -p(q+2) \\ -p(r-3) & 5p \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Bandinkan kedua-dua matriks di atas,

Comparing two matrices above,

$$-p(q-r) = 1$$

$$p = \frac{1}{r-q}$$

29 A

Jadual/Table A:

x	1	3	5	7
y	2	18	50	98
$\frac{y}{x^2}$	2	2	2	2

Jadual/Table B:

x	2	4	6	8
y	4	16	36	68
$\frac{y}{x^2}$	1	1	1	$\frac{17}{16}$

Jadual/Table C:

x	1	2	3	4
y	2	4	6	8
$\frac{y}{x^2}$	2	1	$\frac{2}{3}$	$\frac{1}{2}$

Jadual/Table D:

x	2	3	4	5
y	2	3	4	5
$\frac{y}{x^2}$	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$

30 C

$$g \propto \frac{1}{\sqrt[3]{h}}$$

$$g = \frac{k}{\sqrt[3]{h}}$$

Apabila/When $g = 2$, $h = 64$.

$$k = 2 \times \sqrt[3]{64}$$

$$= 8$$

$$g = \frac{8}{\sqrt[3]{h}}$$

31 D

$$\text{Min/Mean} = \frac{95 + 180 + 240 + 312}{4}$$

$$= 206.75$$

32 B

33 B

$$a = \sqrt{26.5^2 - 14^2}$$

$$= 22.5 \text{ m}$$

$$\text{Luas/Area}$$

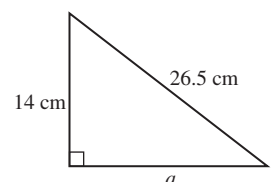
$$= 0.5 \times 28 \times (22.5 \times 2)$$

$$= 630 \text{ m}^2$$

$$\text{Cukai tanah/Quit rent}$$

$$= \text{RM}0.46 \times 630$$

$$= \text{RM}289.80$$



34 C

$$\frac{\sum x}{15} = 5 \Rightarrow \sum x = 75$$

$$\frac{\sum x + y}{16} = 1.2 (5)$$

$$\frac{75+y}{16} = 6$$

$$75 + y = 96$$

$$y = 21$$

Varians baharu

New variance

$$= \frac{\sum x^2 + y^2}{16} = -[1.2(5)]^2$$

$$= \frac{420 + 21^2}{16} - 6^2$$

$$= 17.81$$

$$35 \text{ A } 7\,800 + n - 3\,000 - 0.3(7\,800 + n) = 4\,420$$

$$0.7n + 4\,800 - 2\,340 = 4\,420$$

$$0.7n = 1\,960$$

$$n = 2\,800$$

36 B Polisi pihak ketiga tidak melindungi kerosakan pada kenderaan milik Puan Lisa sendiri, kecurian atau kebakaran.

Third-party policy does not cover damage to Mrs Lisa's own vehicle, theft, or fire.

$$37 \text{ A } \text{Simpulan bulanan/Monthly savings} = \frac{\text{RM}6\,300}{12}$$

$$= \text{RM}525$$

$$\text{Peratusan/Percentage} = \frac{\text{RM}525}{\text{RM}5\,000} \times 100\%$$

$$= 10.5\%$$

38 A Jumlah pendapatan tahunan yang tidak dikecualikan cukai

Total annual income that is not tax exempted

$$= 0.91 \times \text{RM}148\,000$$

$$= \text{RM}134\,680$$

Pendapatan bercukai/Chargeable income

= Jumlah pendapatan tahunan – pengecualian cukai – pelepasan cukai

Total annual income – tax exemption – tax relief

$$= \text{RM}134\,680 - \text{RM}4\,200 - \text{RM}21\,000$$

$$= \text{RM}109\,480$$

39 C

40 C Kos perubatan yang ditanggung oleh Puan Aminah

Medical cost borne by Puan Aminah

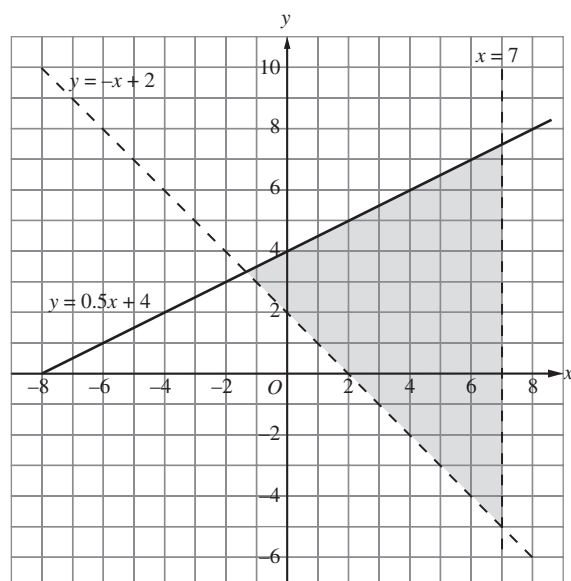
$$= \text{RM}1\,000 + 0.2(\text{RM}32\,000 - \text{RM}1\,000)$$

$$= \text{RM}7\,200$$

KERTAS 2

Bahagian A

1



$$2 \quad \frac{3x(x+2)-4}{2} + 2x = 5x^2$$

$$3x(x+2) - 4 + 5x - 10x^2 = 0$$

$$3x^2 + 6x - 10x^2 + 5x - 4 = 0$$

$$-7x^2 + 11x - 4 = 0$$

$$7x^2 - 11x + 4 = 0$$

$$(7x-4)(x-1) = 0$$

$$7x-4=0 \text{ atau/or } x-1=0$$

$$x = \frac{4}{7} \text{ atau/or } x = 1$$

3 (a) Semua/All

(b) Implikasi 1: Jika y ialah gandaan 4, maka dua digit terakhir bagi y boleh dibahagi dengan 4.

Implication 1: If y is a multiple of 4, then the last two digits of y is divisible by 4.

Implikasi 2: Jika dua digit terakhir bagi y boleh dibahagi dengan 4, maka y ialah gandaan 4.

Implication 2: If the last two digits of y is divisible by 4, y is a multiple of 4.

$$(c) \quad 2 = 2(1^2) + 2(0)$$

$$10 = 2(2^2) + 2(1)$$

$$22 = 2(3^2) + 2(2)$$

$$38 = 2(4^2) + 2(3)$$

⋮

$$2(n^2) + 2(n-1) = 2n^2 + 2n - 2$$

$$2n^2 + 2n - 2, \quad n = 1, 2, 3, \dots$$

$$4 \text{ (a) } A = \begin{bmatrix} 3 & 5 \\ y & -2 \end{bmatrix}, A^{-1} = \frac{1}{3(-2) - 5y} \begin{bmatrix} -2 & -5 \\ -1 & 3 \end{bmatrix}$$

Bandingkan dengan/Comparing with

$$A^{-1} = \frac{1}{k} \begin{bmatrix} -2 & -5 \\ -1 & 3 \end{bmatrix}$$

$$-y = -1$$

$$y = 1$$

$$k = 3(-2) - 5(1)$$

$$= -11$$

(b) $q = 2p$

$$2p - q = 0$$

$$20p + 30q = 400$$

$$\begin{bmatrix} 2 & -1 \\ 20 & 30 \end{bmatrix} \begin{bmatrix} p \\ q \end{bmatrix} = \begin{bmatrix} 0 \\ 400 \end{bmatrix}$$

$$\begin{bmatrix} p \\ q \end{bmatrix} = \begin{bmatrix} 2 & -1 \\ 20 & 30 \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ 400 \end{bmatrix}$$

$$\begin{bmatrix} p \\ q \end{bmatrix} = \frac{1}{2(30) - (-1)20} \begin{bmatrix} 30 & 1 \\ -20 & 2 \end{bmatrix} \begin{bmatrix} 0 \\ 400 \end{bmatrix}$$

$$= \frac{1}{80} \begin{bmatrix} 400 \\ 800 \end{bmatrix}$$

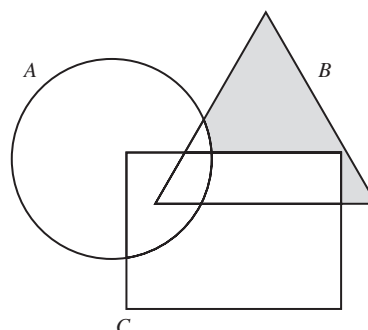
$$= \begin{bmatrix} 5 \\ 10 \end{bmatrix}$$

$$\therefore p = 5, q = 10$$

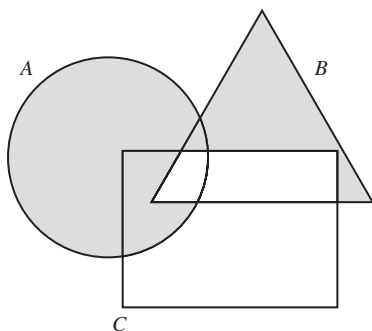
5 (a) $\{(3, Y), (3, O), (3, U), (5, Y), (5, O), (5, U), (6, Y), (6, O), (6, U), (8, Y), (8, O), (8, U)\}$

$$(b) \text{ (i) } \frac{4}{12} = \frac{1}{3} \quad \text{(ii) } \frac{2}{12} = \frac{1}{6}$$

6 (a)



(b)



- 7 (a) Kadar perubahan jarak
Rate of change of distance

$$= \frac{54}{60}$$

$$= 54 \text{ km j}^{-1}/\text{km h}^{-1}$$

- (b) Laju purata
Average speed

$$= \frac{54 \times 2}{140}$$

$$= 46.29 \text{ km j}^{-1}/\text{km h}^{-1}$$

- 8 (a) $V = \{P, Q, R, S, T\}$

- (b) $E = \{e_1, e_2, e_3, e_4, e_5, e_6, e_7, e_8, e_9\}$

- (c) Jumlah sudut/Sum of degrees

$$= 9 \times 2$$

$$= 18$$

- 9 (a) $P \propto \frac{Q^3}{\sqrt{R}}$

$$P = \frac{kQ^3}{\sqrt{R}}$$

$$2 = \frac{k(1^3)}{\sqrt{81}}$$

$$k = 18$$

$$\therefore P = \frac{18Q^3}{\sqrt{R}}$$

- (b) $5 = \frac{18(\sqrt[3]{2})^3}{\sqrt{m}}$

$$\sqrt{m} = \frac{36}{5}$$

$$m = \frac{1296}{25}$$

$$m = 51.84$$

- 10 Julat antara kuartil

Interquartile range

$$= 25 - 12$$

$$= 13$$

Julat antara kuartil baharu

New interquartile range

$$= 13 \times 2$$

$$= 26$$

Bahagian B

- 11 (a) Pendapatan tahunan yang tidak dikecualikan cukai

Annual income that is not tax exempted

$$= \text{RM}125\,000 - \text{RM}12\,000$$

$$= \text{RM}113\,000$$

Pendapatan bercukai = Pendapatan tahunan – pengecualian cukai – pelepasan cukai

Chargeable income = Annual income – tax exemption – tax relief

$$= \text{RM}113\,000 - \text{RM}3\,500 - \text{RM}19\,000$$

$$= \text{RM}90\,500$$

- (b) Cukai pendapatan/Income tax payable

$$= \text{RM}4\,600 + (\text{RM}90\,500 - \text{RM}70\,000 \times 0.21 - \text{RM}950)$$

$$= \text{RM}7\,955$$

- (c) PCB yang dibayar dalam setahun/PCB paid in a year
= $\text{RM}595 \times 12$

$$= \text{RM}7\,140$$

Cukai yang dibayar adalah tidak mencukupi. Encik Faisal harus bayar baki $\text{RM}7955 - \text{RM}7140 = \text{RM}815$ kepada Lembaga Hasil Dalam Negeri.

The tax paid is not sufficient. Encik Faisal need to pay balance of $\text{RM}7955 - \text{RM}7140 = \text{RM}815$ to the Inland Revenue Board.

- (d) Rebate cukai sebanyak $\text{RM}400$ akan diberi kepada pembayar cukai jika pendapatan bercukai tidak melebihi $\text{RM}35\,000$.

Tax rebate of $\text{RM}400$ will be given to taxpayer if his chargeable income does not exceed $\text{RM}35\,000$.

- (e) Pelepasan cukai adalah pengurangan daripada jumlah pendapatan untuk memperoleh pendapatan bercukai anda. Rebate cukai ditolak daripada jumlah cukai sebenar yang dikenakan.

Tax relief is the deduction from the total income to derive your chargeable income. Tax rebate is deducted from the actual tax amount charged.

- 12 (a) Apabila/When $x = -4$,

$$y = (-4)^3 - 3(-4) + 2$$

$$= -50$$

Apabila/When $x = -1$,

$$y = (-1)^3 - 3(-1) + 2$$

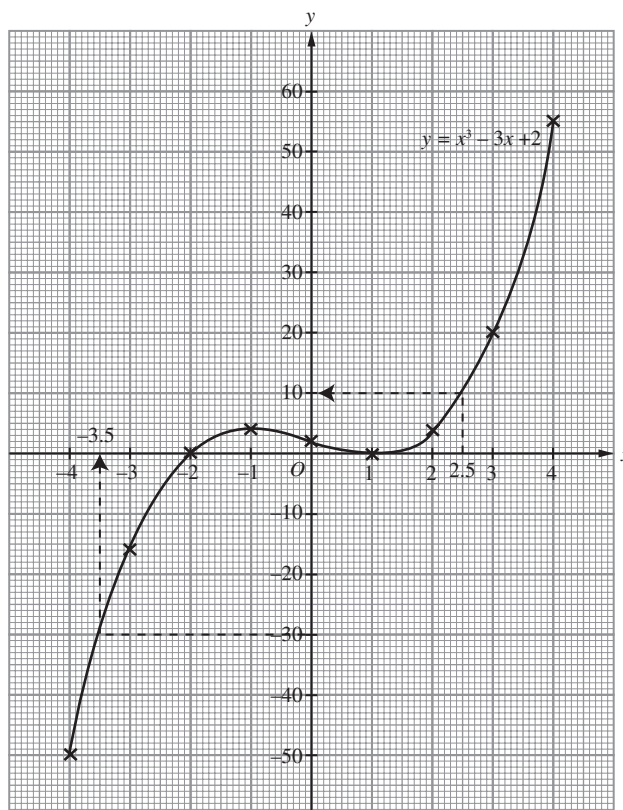
$$= 4$$

Apabila/When $x = 3$,

$$y = 3^3 - 3(3) + 2$$

$$= 20$$

- (b)



- (c) (i) $y = 10$

- (ii) $x = -3.5$

- 13 (a) (i) $\frac{0.5 \times 5 \times v}{0.5 \times (v + 42) \times 3 + 0.5 \times 7 \times 42} = \frac{1}{2}$

$$5v = 1.5v + 210$$

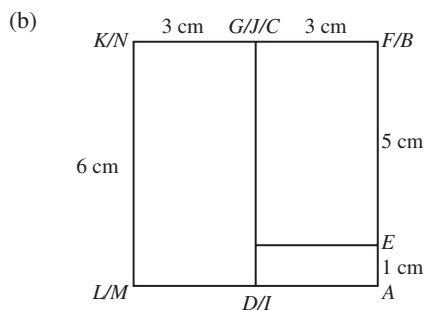
$$3.5v = 210$$

$$v = 60$$

- (ii) Kadar perubahan laju
Rate of change of speed

$$= \frac{60 - 42}{2}$$

$$= 6 \text{ m s}^{-2}$$

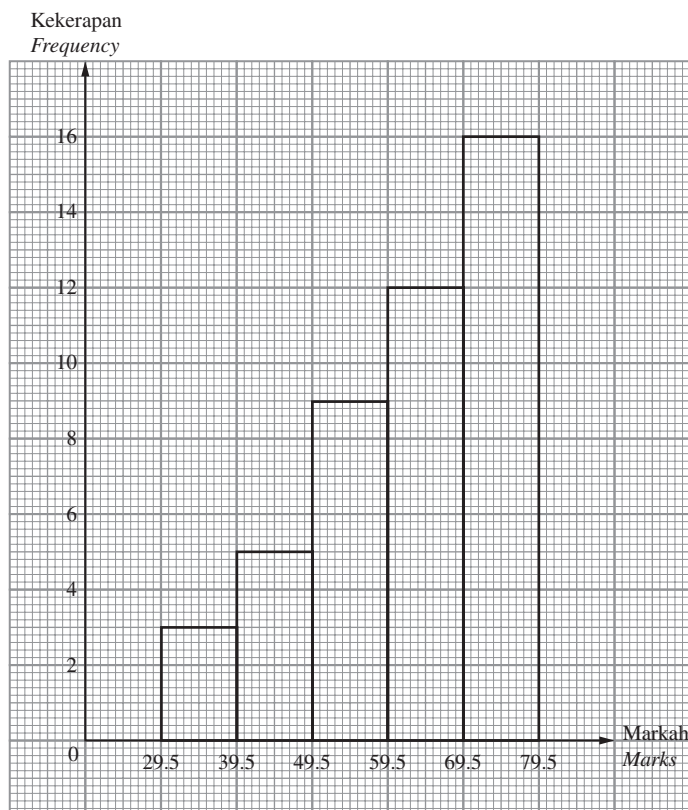


14 (a)

Markah Marks	Kekerapan Frequency	Sempadan bawah Lower boundary	Sempadan atas Upper boundary
30 – 39	3	29.5	39.5
40 – 49	5	39.5	49.5
50 – 59	9	49.5	59.5
60 – 69	12	59.5	69.5
70 – 79	16	69.5	79.5

(b) 70 – 79 markah/marks

(c) (i)



- (ii) Pencong ke kiri/Left skewed

15 (a) (i) (2, -5)

(ii) (3, 1)

(b) (i) Putaran 90° arah lawan jam pada pusat (0, -1).

Rotation of 90° anticlockwise at centre (0, -1).

(ii) Translasi/Translation $\begin{pmatrix} 4 \\ -4 \end{pmatrix}$

Bahagian C

16 (a) (i) 18

(ii) Julat antara kuartil/Interquartile range
= 556 – 502
= 54

(b) (i) $n(M) = 28$
 $12 + 7 + 4 + a = 28$
 $a = 5$

(ii) $7 + 4 + 5 + b = 30$
 $b = 14$

(iii) $n(\xi) = 12 + 7 + 4 + 8 + 9 + 5 + 14 + 1$
= 60

(c) (i) $\frac{8}{20} \times \frac{7}{19} = 0.1474$

(ii) $\frac{15}{25} \times \frac{10}{24} = 0.25$

(d) (i) $76 = \frac{\sum x}{12}$
 $\sum x = 912$

$$\sqrt{\frac{\sum x^2}{12}} - 76^2 = 5$$

$$\frac{\sum x^2}{12} - 76^2 = 5^2$$

$$\sum x^2 = 12(5^2 + 76^2)$$

$$= 69\,612$$

(ii) $\frac{980}{n} = 70$
 $n = 14$

$$\sigma_B = \sqrt{\frac{69\,700}{12} - 70^2}$$

$$= 8.864 > \sigma_A = 5$$

Jualan Restoran A adalah lebih konsisten sebab nilai sisihan piawainya adalah lebih rendah.

Sales of Restaurant A is more consistent because the value of standard deviation is smaller.

17 (a) (i) Salah. Prinsipal pinjaman hanya 85% daripada harga motosikal.

Incorrect. The loan principal is only 85% of the price of the motorcycle.

(ii) Ansuran bulanan/Monthly instalment

$$= \frac{0.85 \times \text{RM}42\,000 + 0.85 \times \text{RM}42\,000 \times 0.038 \times 5}{12}$$

$$= \text{RM}708.05$$

(b) $\left(\frac{1.2}{100} \times 250\,000\right) \times \left(\frac{0.8}{100} \times 250\,000\right) = 6\,000\,000 \text{ m}^2$

(c) Katakan jarak antara rumah Ahmad ke taman permainan ialah n .

Let the distance between Ahmad's house to the playground be n .

$$n^2 + n = 600$$

$$n^2 + n - 600 = 0$$

$$(n - 24)(n + 25) = 0$$

$$n = 24 \text{ atau/or } n = -25 \text{ (ditolak/rejected)}$$

Jarak antara rumah Ahmad ke kedai runcit
Distance of Ahmad's house to grocery store
= 24²

$$= 576 \text{ m}$$

(d) Katakan d ialah jarak mengufuk.

Let d be the horizontal distance.

$$\cos 60^\circ = \frac{d}{5}$$

$$0.5 = \frac{d}{5}$$

$$d = 2.5 \text{ m}$$