Jawapan

Ujian Akhir Sesi Akademik

Bahagian A

1 1, 2, 3, 5, 8, m, 21, n, 55, …

$3 = 1 + 2$

$5 = 2 + 3$

$8 = 3 + 5$

$m = 5 + 8$

$= 13$

$21 = 8 + 13$

$n = 13 + 21$

$= 34$

$55 = 21 + 34$

Jawapan/*Answer*: **C**

2 $(2k + 7)(k - 2) - (k^2 + 4k - 2)$

$= 2k^2 + 3k - 14 - k^2 - 4k + 2$

$= k^2 - k - 12$

$= (k - 4)(k + 3)$

k	$+3$	$+3k$
k	-4	$-4k$
k^2	-12	$-k$

Jawapan/*Answer*: **A**

3 $\dfrac{2}{r+3} - \dfrac{5}{3r-5} = \dfrac{2(3r-5) - 5(r+3)}{(r+3)(3r-5)}$

$= \dfrac{6r - 10 - 5r - 15}{(r+3)(3r-5)}$

$= \dfrac{r - 25}{(r+3)(3r-5)}$

Jawapan/*Answer*: **D**

4 $p = \dfrac{2t + 13}{t - 8}$

$p(t - 8) = 2t + 13$

$pt - 8p = 2t + 13$

$pt - 2t = 8p + 13$

$t(p - 2) = 8p + 13$

$t = \dfrac{8p + 13}{p - 2}$

Jawapan/*Answer*: **C**

5 Sudut pedalaman bagi heksagon $PQRSTU$

Interior angle of hexagon PQRSTU

$= \dfrac{(6 - 2) \times 180°}{6}$

$= 120°$

$x = 180° - 120°$

$= 60°$

$\angle QPU = 120°$

$y = \dfrac{1}{2} \times (180° - 120°)$

$= 30°$

Jawapan/*Answer*: **B**

6 Luas sektor ORS = Luas sektor OPR = Luas sektor OQS

Area of sector ORS = Area of sector OPR

= Area of sector OQS

$= \dfrac{60°}{360°} \times \pi \times 6^2$

$= 6\pi \text{ cm}^2$

Luas rantau berlorek $KPRL$ = Luas rantau berlorek $QNMS$

Area of shaded region KPRL = Area of shaded region QNMS

$= \dfrac{60°}{360°} \times \pi \times 12^2 - 6\pi$

$= 24\pi - 6\pi$

$= 18\pi \text{ cm}^2$

Luas rantau berlorek

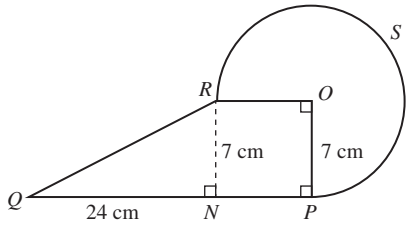
Area of shaded region

$= 18\pi + 18\pi + 6\pi$

$= 42\pi \text{ cm}^2$

Jawapan/*Answer*: **D**

7



$QR^2 = 24^2 + 7^2$

$= 625$

$QR = 25$ cm

Panjang lengkok PSR

Length of arc PSR

$= \dfrac{270°}{360°} \times 2 \times \dfrac{22}{7} \times 7$

$= 33$ cm

Perimeter bagi seluruh rajah

Perimeter of the whole diagram

$= 33 + 25 + 31$

$= 89$ cm

Jawapan/*Answer*: **B**

8 $GM^2 = 10^2 - 6^2$

$= 64$

$GM = 8$ cm

Luas permukaan bagi pepejal gabungan

Surface area of the composite solid

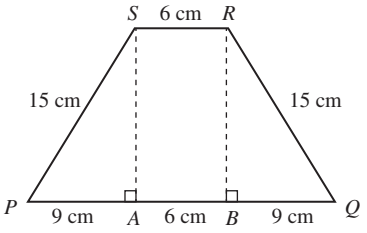
$= 2(12 \times 8) + 2(8 \times 4) + 12 \times 4 + 4 \times 4 + 2\left(\dfrac{1}{2} \times 6 \times 8\right) + 8 \times 6 + 8 \times 10 + 8 \times 4$

$= 192 + 64 + 48 + 16 + 48 + 48 + 80 + 32$

$= 528 \text{ cm}^2$

Jawapan/*Answer*: **D**

9



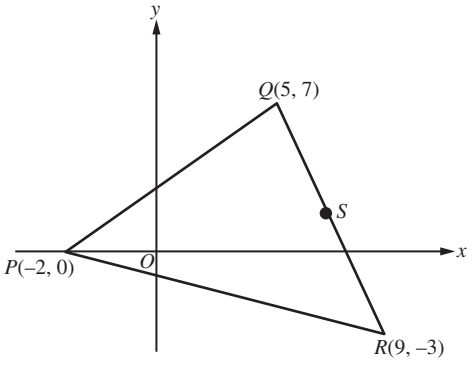
$RB^2 = 15^2 - 9^2$
$= 144$
$RB = 12$ cm

Isi padu bagi pepejal yang tinggal
Volume of the remaining solid

$= \frac{1}{2} \times (6 + 24) \times 12 \times 20 - \frac{1}{2} \times \frac{22}{7} \times 7^2 \times 20$
$= 3\,600 - 1\,540$
$= 2\,060\ \text{cm}^3$

Jawapan/*Answer*: **B**

10



Titik tengah bagi *QR*, *S*
Midpoint of QR, S

$= \left(\frac{5 + 9}{2}, \frac{7 - 3}{2}\right)$
$= (7, 2)$

Titik tengah bagi *PS*
Midpoint of PS

$= \left(\frac{-2 + 7}{2}, \frac{0 + 2}{2}\right)$
$= \left(\frac{5}{2}, 1\right)$

Jawapan/*Answer*: **B**

11 A $y = x^2 - 3$
Apabila/*When* $x = -2$, $y = (-2)^2 - 3$
$= 4 - 3$
$= 1$
Apabila/*When* $x = 1$, $y = 1^2 - 3$
$= 1 - 3$
$= -2$
Apabila/*When* $x = 4$, $y = 4^2 - 3$
$= 16 - 3$
$= 13$

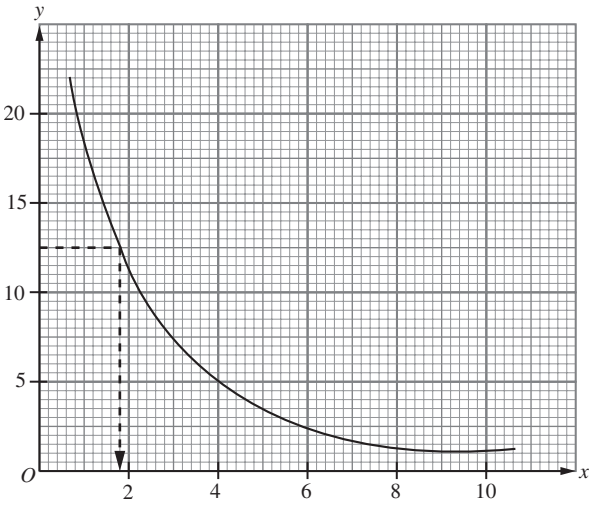
B $y = 5 - x^2$
Apabila/*When* $x = -2$, $y = 5 - (-2)^2$
$= 5 - 4$
$= 1$
Apabila/*When* $x = 1$, $y = 5 - 1^2$
$= 5 - 1$
$= 4$

C $y = 2x^2 - 1$
Apabila/*When* $x = -2$, $y = 2(-2)^2 - 1$
$= 8 - 1$
$= 7$

D $y = 2x^2 - 4$
Apabila/*When* $x = -2$, $y = 2(-2)^2 - 4$
$= 8 - 4$
$= 4$

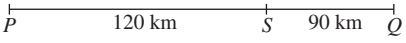
Jawapan/*Answer*: **A**

12



Apabila/*When* $y = 12.5$, $x = 1.8$.
Jawapan/*Answer*: **C**

13



Jumlah jarak yang dilalui
Total distance travelled
$= 120 + 90$
$= 210$ km

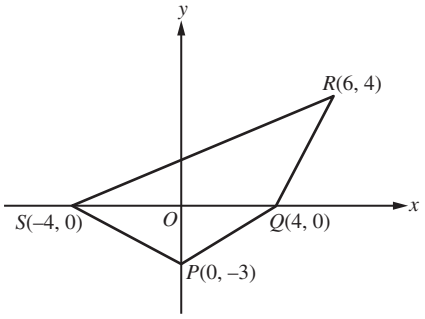
Jumlah masa yang diambil
Total time taken
= 2.5 jam
2.5 *hours*

Laju purata
Average speed

$= \frac{210}{2.5}$
= 84 km/j
84 km/h

Jawapan/*Answer*: **B**

14



Kecerunan *PQ*
Gradient of PQ

$= \frac{0 + 3}{4 - 0}$

$= \frac{3}{4}$

Kecerunan *QR*
Gradient of QR

$= \frac{4 - 0}{6 - 4}$

$= \frac{4}{2}$

$= 2$

Kecerunan *RS*
Gradient of RS

$= \frac{4 - 0}{6 + 4}$

$= \frac{4}{10}$

$= \frac{2}{5}$

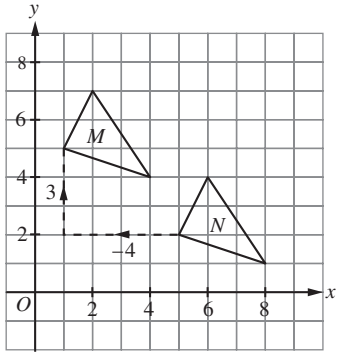
Kecerunan *PS*
Gradient of PS

$= \frac{-3 - 0}{0 + 4}$

$= -\frac{3}{4}$

Jawapan/*Answer*: **D**

15



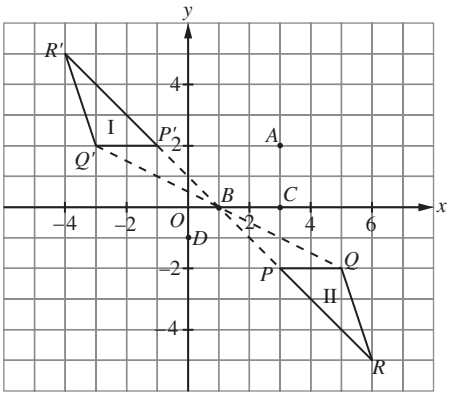
Translasi itu ialah $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$.

The translation is $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$.

$p = -4, q = 3$

Jawapan/*Answer*: **A**

16



$\angle PBP' = \angle QBQ' = \angle RBR' = 180°$

Pusat bagi putaran itu ialah *B*.

The centre of the rotation is B.

Jawapan/*Answer*: **B**

17

Markah ***Mark***	1	2	3	4	5
Bilangan murid ***Number of students***	2	k	4	6	2

Jika markah mod = 2, $k > 6$.

$\therefore$ Nilai terkecil bagi k ialah 7.

If the modal mark = 2, $k > 6$.

$\therefore$ *The smallest value of k is* 7.

Jawapan/*Answer*: **C**

18 $\sum fx = 3(3) + 8(8) + 2(13) + 7(18) + 5(23)$

$= 9 + 64 + 26 + 126 + 115$

$= 340$

Min/*Mean* $= \frac{340}{25}$

$= 13.6$ tahun/*years*

Jawapan/*Answer*: **B**

19 $n(S) = 9$

A = Peristiwa bahawa satu nombor perdana dipilih

A = *Event that a prime number is chosen*

$= \{17, 31, 43\}$

$n(A) = 3$

$P(A) = \frac{n(A)}{n(S)}$

$= \frac{3}{9}$

$= \frac{1}{3}$

Jawapan/*Answer*: **C**

20 $n(H) = x$

$n(S) = 10 + x$

$P(H) = \frac{n(H)}{n(S)}$

$\frac{x}{10 + x} = \frac{2}{7}$

$7x = 2(10 + x)$

$7x = 20 + 2x$

$5x = 20$

$x = 4$

∴ Bilangan epal yang berwarna hijau ialah 4.

∴ *Number of green apples is* 4.

Jawapan/*Answer*: **A**

Bahagian B

1
$7 = 15 - 8 \times 1$

$-1 = 15 - 8 \times 2$

$-9 = 15 - 8 \times 3$

$-17 = 15 - 8 \times 4$

⋮

Sebutan ke-25

The 25^{th} *term*

$= 15 - 8 \times 25$

$= 15 - 200$

$= -185$

2 (a) $\dfrac{k-1}{h-1} = \dfrac{1}{3}$

$3(k-1) = h - 1$

$3k - 3 = h - 1$

$h = 3k - 2$

(b) (2, −3): $h = 2$, $k = -3$

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

$= -9 - 2$

$= -11$

$h \neq 3k - 2$

∴ (2, −3) bukan koordinat-koordinat yang mungkin bagi titik *B*.

∴ (2, −3) *is not a possible coordinates of point B.*

(4, 2): $h = 4$, $k = 2$

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

$= 6 - 2$

$= 4$

$h = 3k - 2$

∴ (4, 2) ialah koordinat-koordinat yang mungkin bagi titik *B*.

∴ (4, 2) *is a possible coordinates of point B.*

(−5, −1): $h = -5$, $k = -1$

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

$= -3 - 2$

$= -5$

$h = 3k - 2$

∴ (−5, −1) ialah koordinat-koordinat yang mungkin bagi titik *B*.

∴ (−5, −1) *is a possible coordinates of point B.*

3 (a) (i) ✓

(ii) ✓

(iii) ✓

(b) 3, 7, 7, 9, 12, 15

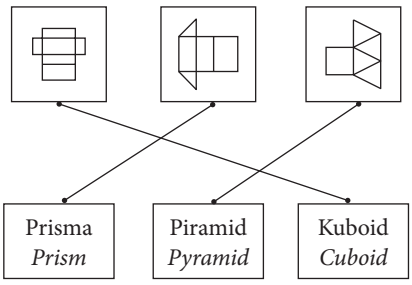
Median $= \dfrac{7+9}{2} = 8$

4 (a) Fungsi banyak kepada satu/*Many-to-one function*

(b) Bukan fungsi/*Not a function*

(c) Fungsi satu kepada satu/*One-to-one function*

5 (a)



(b) $x^2 + 2$

Bahagian C

1 (a) (i) $h^2 - 2h + 1 = (h-1)(h-1)$

$2h^2 - 7h + 5 = (2h-5)(h-1)$

(ii) $\dfrac{h^2 - 2h + 1}{2h^2 - 7h + 5} = \dfrac{(h-1)^2}{(2h-5)(h-1)}$

$= \dfrac{h-1}{2h-5}$

(b) $\dfrac{6}{y} - \dfrac{y+5}{y(2y^2-50)} = \dfrac{6}{y} - \dfrac{y+5}{2y(y^2-25)}$

$= \dfrac{6}{y} - \dfrac{y+5}{2y(y+5)(y-5)}$

$= \dfrac{6}{y} - \dfrac{1}{2y(y-5)}$

$= \dfrac{12(y-5)-1}{2y(y-5)}$

$= \dfrac{12y - 60 - 1}{2y(y-5)}$

$= \dfrac{12y - 61}{2y(y-5)}$

(c) (i) $r = \sqrt{\dfrac{1}{2}p + 4v}$

$r^2 = \dfrac{1}{2}p + 4v$

$\dfrac{1}{2}p = r^2 - 4v$

$p = 2(r^2 - 4v)$

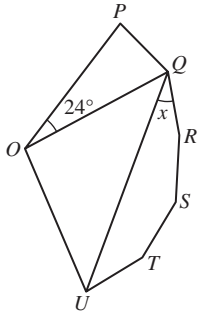
(ii) Apabila/*When* $r = 4$, $v = 3\dfrac{1}{2}$

$p = 2\left[4^2 - 4\left(\dfrac{7}{2}\right)\right]$

$= 2(16 - 14)$

$= 4$

2 (a) (i)



$n = \frac{360°}{24°}$

$= 15$

Bilangan sisi bagi poligon sekata itu ialah 15.

The number of sides of the regular polygon is 15.

(ii) $\angle QOU = 4 \times 24°$

$= 96°$

$\angle OQU = \frac{1}{2} \times (180° - 96°)$

$= 42°$

$\angle OQP = \frac{1}{2} \times (180° - 24°)$

$= 78°$

Sudut pedalaman bagi poligon sekata

Interior angle of regular polygon

$= \frac{(15 - 2) \times 180°}{15}$

$= 156°$

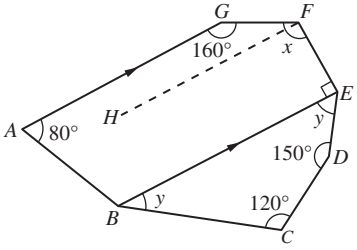
$\angle PQR = 156°$

$x + 42° + 78° = 156°$

$x + 120° = 156°$

$x = 36°$

(b)



$\angle GFH = 180° - 160°$

$= 20°$

$\angle EFH = 180° - 90°$

$= 90°$

$x = 20° + 90°$

$= 110°$

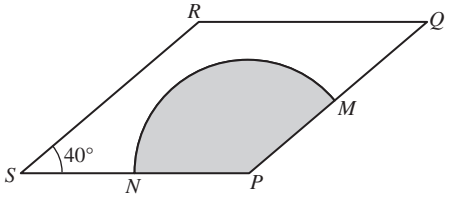
$y + y + 120° + 150° = 360°$

$2y + 270° = 360°$

$2y = 90°$

$y = 45°$

(c)



$\angle QPS = 180° - 40°$

$= 140°$

Luas tanah yang ditanami terong

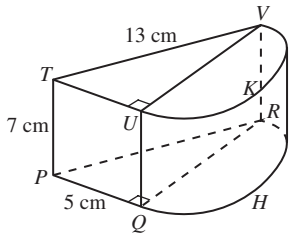
Land area planted with brinjals

$= 3\,150 - \frac{140°}{360°} \times \frac{22}{7} \times 35^2$

$= 3\,150 - 1\,497.22$

$= 1\,652.78 \text{ m}^2$

3



(a) (i) $UV^2 = 13^2 - 5^2$

$= 169 - 25$

$= 144$

$UV = 12$ cm

Diameter bagi separuh silinder itu ialah 12 cm.

The diameter of the half cylinder is 12 cm.

(ii) Isi padu bagi pepejal

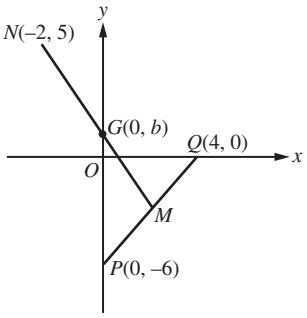
Volume of the solid

$= \frac{1}{2} \times \frac{22}{7} \times 6^2 \times 7 + \frac{1}{2} \times 5 \times 12 \times 7$

$= 396 + 210$

$= 606 \text{ cm}^3$

(b)



(i) Koordinat bagi titik M

The coordinates of point M

$= \left(\frac{0 + 4}{2}, \frac{-6 + 0}{2}\right)$

$= (2, -3)$

(ii) Kecerunan GM = Kecerunan MN

Gradient of GM = *Gradient of MN*

$\frac{b + 3}{0 - 2} = \frac{-3 - 5}{2 + 2}$

$\frac{b + 3}{-2} = \frac{-8}{4}$

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

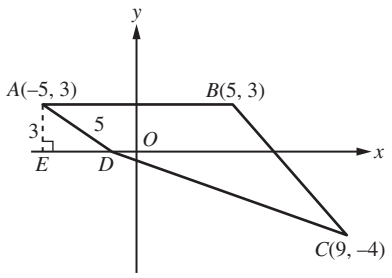
$b + 3 = 4$

$b = 1$

∴ Pintasan-y bagi garis lurus MN ialah 1.

∴ *The y-intercept of the straight line MN is* 1.

(c)



(i) $AB = 2AD$
$10 = 2AD$
$AD = 5$ unit/*units*
$DE = 4$ unit/*units*
$OD = 5 - 4 = 1$ unit/*unit*
Koordinat bagi titik D ialah $(-1, 0)$.
The coordinates of point D are $(-1, 0)$.

(ii) $CD = \sqrt{(9 + 1)^2 + (-4 - 0)^2}$
$= \sqrt{10^2 + (-4)^2}$
$= \sqrt{100 + 16}$
$= \sqrt{116}$
$= 10.8$ unit/*units*

4 (a) (i) 2.85 2.94 3.03 3.06 3.08 3.08 3.14 3.22

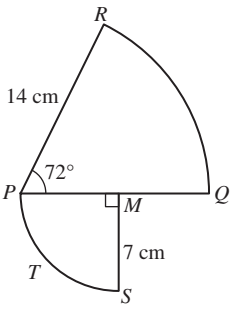
$$\text{Median} = \frac{3.06 + 3.08}{2}$$
$$= 3.07 \text{ kg}$$

(ii) 2.85 2.94 3.03 3.06 3.08 3.08 3.14 3.22 3.47
Median = 3.08 kg
Median jisim bayi-bayi itu bertambah sebanyak 0.01 kg.
The median mass of the babies increases by 0.01 kg.

(b) 81 km/j
81 km/h

$$= \frac{81\,000 \text{ m}}{3\,600 \text{ s}}$$
$$= 22.5 \text{ m/s}$$
$$\frac{v - 22.5}{30} = \frac{1}{4}$$
$$v - 22.5 = 7.5$$
$$v = 30 \text{ m/s}$$
$$= \frac{\frac{30}{1\,000}\text{ km}}{\frac{1}{3\,600}\text{ j}}$$
$$\frac{\frac{30}{1\,000}\text{ km}}{\frac{1}{3\,600}\text{ h}}$$
$$= \frac{30}{1\,000} \times 3\,600 \text{ km/j}$$
$$\frac{30}{1\,000} \times 3\,600 \text{ km/h}$$
$$= 108 \text{ km/j}$$
$$108 \text{ km/h}$$

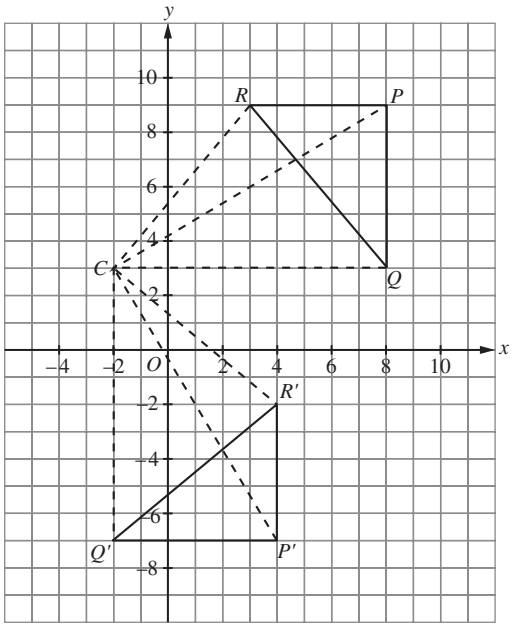
(c)



Perimeter bagi seluruh rajah
Perimeter of the whole diagram

$$= \frac{72°}{360°} \times 2 \times \frac{22}{7} \times 14 + \frac{1}{4} \times 2 \times \frac{22}{7} \times 7 + 14 + 7 + 7$$
$$= 17.6 + 11 + 28$$
$$= 56.6 \text{ cm}$$

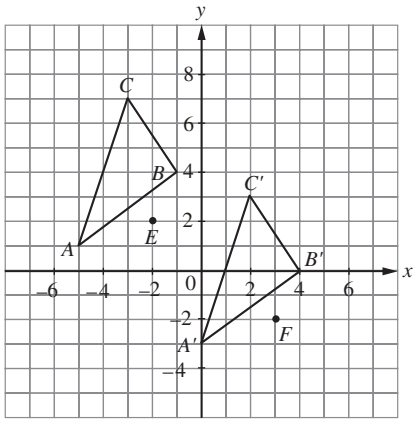
5 (a) (i)



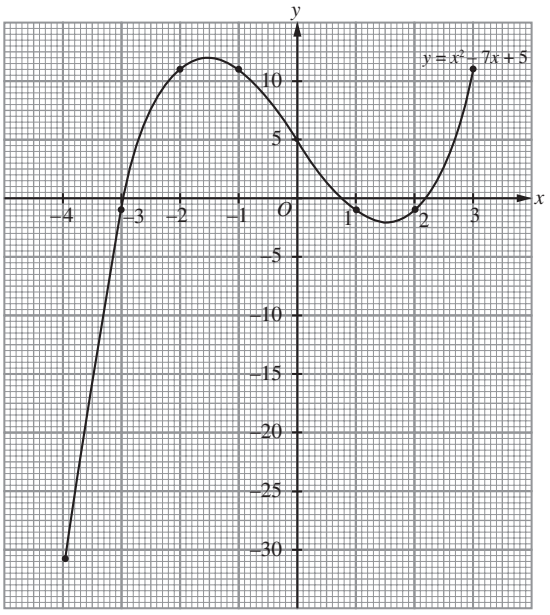
(ii) $\angle POP' = \angle QOQ' = \angle ROR' = 90°$
Sudut putaran/*Angle of rotation* = 90°

(b) (i) $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$

(ii)



(c) (i)



(ii) Apabila/*When* $x = 2.4$, $y = 2$.

$y = x^3 - 7x + 5$

$2 = 2.4^3 - 7(2.4) + 5$

$2 = 2.4^3 - 11.8$

$2.4^3 = 13.8$

6 (a) (i) Kelas mod ialah 10 – 12.

The modal class is 10 – 12.

(ii) $\sum fx = 10(2) + 9(5) + 6(8) + 15(11) + 8(14) + 2(17)$

$= 20 + 45 + 48 + 165 + 112 + 34$

$= 424$

Min/*Mean* $= \frac{424}{50} = 8.48$ tingkat/*floors*

(b) $S = \{x : 1 \leqslant x < 30, x$ ialah suatu integer$\}$

$S = \{x : 1 \leqslant x < 30, x$ *is an integer*$\}$

$n(S) = 29$

(i) $A = \{1, 8, 27\}$

$n(A) = 3$

$P(A) = \frac{n(A)}{n(S)}$

$= \frac{3}{29}$

(ii) $B = \{3, 6, 9, 12, 15, 18, 21, 24, 27\}$

$n(B) = 9$

$P(B) = \frac{n(B)}{n(S)}$

$= \frac{9}{29}$

$P(B') = 1 - P(B)$

$= 1 - \frac{9}{29} = \frac{20}{29}$

(c) (i) {(A, S), (A, I), (A, N), (A, E), (R, S), (R, I), (R, N), (R, E), (C, S), (C, I), (C, N), (C, E)}

(ii) (a) A = Peristiwa bahawa kad pertama yang dipilih itu ialah huruf vokal

A = *Event that the first card that is chosen is a vowel*

$= \{(A, S), (A, I), (A, N), (A, E)\}$

$n(A) = 4$

$n(S) = 12$

$P(A) = \frac{n(A)}{n(S)}$

$= \frac{4}{12}$

$= \frac{1}{3}$

(b) B = Peristiwa bahawa sekurang-kurangnya sekeping kad yang dipilih itu ialah huruf konsonan

B = *Event that at least a card that is chosen is a consonant*

$= \{(A, S), (A, N), (R, S), (R, I), (R, N), (R, E), (C, S), (C, I), (C, N), (C, E)\}$

$n(B) = 10$

$P(B) = \frac{n(B)}{n(S)}$

$= \frac{10}{12}$

$= \frac{5}{6}$