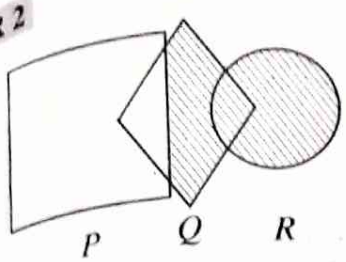
C Ali's restaurant, $x = (4 \times RM30) + (6 \times RM21.60)$
Ayu's restaurant, $y = (7 \times RM30) + (9 \times RM21.60)$

So,

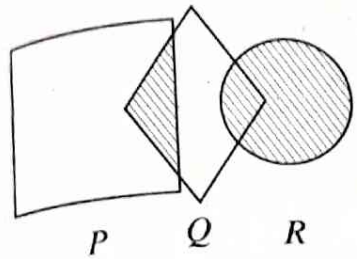
$$\begin{pmatrix} 4 & 6 \\ 7 & 9 \end{pmatrix}\begin{pmatrix} 30.00 \\ 21.60 \end{pmatrix} = \begin{pmatrix} x \\ y \end{pmatrix}$$

APER 2

(a)



(b)



(a) $\angle PKN$ / $\angle QLM$

(b) $\cos\theta = \dfrac{1.5 \text{ cm}}{4.5 \text{ cm}}$

$\cos\theta = \dfrac{1}{3}$

$\theta = \cos^{-1}\left(\dfrac{1}{3}\right)$

$\theta = 70.53°$ or $70° 32'$

Volume of FGK

$= \dfrac{1}{4}(\pi r^2 h)$

$= \dfrac{1}{4}\left(\dfrac{22}{7} \times 5^2 \times 7\right)$

$= \dfrac{1}{4}\left(\dfrac{22}{7} \times 25 \times 7\right)$

$= 137\dfrac{1}{2} \text{ cm}^3$

Volume of $ABGF$

$= \left[\dfrac{1}{2}(10 + 5)5\right] \times 7$

$= \dfrac{5}{2}(15) \times 7$

$= \dfrac{525}{2}$

$= 262\dfrac{1}{2} \text{ cm}^3$

Total volume of solid

$= 137\dfrac{1}{2} \text{ cm}^3 + 262\dfrac{1}{2} \text{ cm}^3$

$= 400 \text{ cm}^3$

4 Let bicycle = x and tricycle = y

So,

$2x + 2y = 64$ ..... (1)

$2x + 3y = 74$ ..... (2)

(2) − (1)

$3y - 2y = 74 - 64$

$y = 10$

When $y = 10$

$2x + 3(10) = 74$

$2x = 74 - 30$

$2x = 44$

$x = 22$

Thus the number of bicycles are 22 and the number of tricycles are 10

5 (a) False, 2 is a smaller value than 3, $2 < 3$

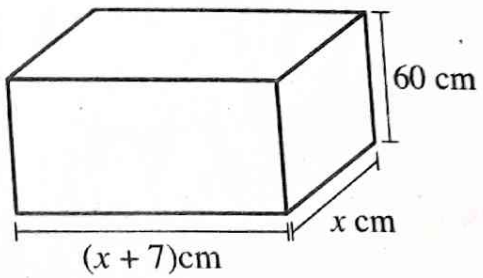
(b) i. If $a > b$, then $a - b > 0$

ii. If $a - b > 0$, then $a > b$

(c) Number of sides = 3,
Number of symmetry = 3
Number of sides = 4,
Number of symmetry = 4
Number of sides = 5,
Number of symmetry = 5
Number of sides = n,
Number of symmetry = n

Conclusion: Number of sides of regular polygon = Number of symmetry of regular polygon

6



Volume of aquarium = 48 000 cm³

So,

$(x)(x + 7)(60) \text{ cm}^3 = 48\,000 \text{ cm}^3$

$(x)(x + 7) = \dfrac{48000}{60}$

$x^2 + 7x = 800$

$x^2 + 7x - 800 = 0$

$(x - 25)(x + 32) = 0$

$x - 25 = 0, \quad x + 32 = 0$

$x = 25 \qquad x = -32$ (not accepted because −ve)

So the value of $x = 25$ cm

7 Ahmad spent RM31. He bought 2 food coupons and 5 drink coupons.
Lim spent RM27. He bought 3 food coupons and 1 drink coupon.

x = price of one food coupon
y = price of one drink coupon

$$\begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 31 \\ 27 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \end{bmatrix} = \frac{1}{2(1)-5(3)}\begin{bmatrix} 1 & -5 \\ -3 & 2 \end{bmatrix}\begin{bmatrix} 31 \\ 27 \end{bmatrix}$$

$$= \frac{1}{2-15}\begin{pmatrix} 1(31)-5(27) \\ -3(31)+2(27) \end{pmatrix}$$

$$= \frac{1}{-13}\begin{pmatrix} -104 \\ -39 \end{pmatrix}$$

$$= \begin{pmatrix} 8 \\ 3 \end{pmatrix}$$

Thus, the price for a food coupon is RM8 and the price for drink coupon is RM3

8 (*a*) $2y = 3x + 15$

When $y = 0$

$3x + 15 = 0$

$3x = -15$

$x = -5$

Ridwan's house = $(-5, 0)$

School = $(3, 0)$

Distance = $3 - (-5)$

= 8 units

= 8 km

(*b*) $2y = 3x + 15$

$$y = \frac{3}{2}x + \frac{15}{2}$$

Thus $m = \frac{3}{2}$

Linear equation $\neq y = mx + c$ at point $(3, 0)$

$$0 = \frac{3}{2}(3) + c$$

$$\frac{9}{2} + c = 0$$

$9 + 2c = 0$

$2c = -9$

$$c = \left(-\frac{9}{2}\right)$$

Thus the linear equation is

$$y = \frac{3}{2}x - \frac{9}{2}$$

$2y = 3x - 9$

9 (*a*)
$\{(E,F),(E,G),(E,H),(E,U),(F,E),(F,G),(F,H),(F,U),$
$(G,E),(G,F),(G,H),(G,U),(H,E),(H,F),(H,G),(H,U),$
$(U,E),(U,F),(U,G),(U,H)\}$

(*b*) (i)
$\{(E,F),(E,G),(E,H),(E,U),(U,E),(U,F),(U,G),$
$(U,H)\}$

Probability of first card with vowels $= \frac{8}{20}$

$$= \frac{2}{5}$$

(ii)
$\{(F,E),(F,U),(G,E),(G,U),(H,E),(H,U)\}$

Probability $= \frac{6}{20}$

$$= \frac{3}{10}$$

10 (*a*) Diameter = 18 m

Radius = 9 m

Circumference $= 2\pi r$

$$= 2 \times \frac{22}{7} \times 9 \text{ m}$$

$$= \frac{396}{7} \text{ m}$$

$$\frac{396}{7} \times P = 600 \text{ m}$$

$$P = 600 \times \frac{7}{396}$$

$$= \frac{350}{33} \text{ rounds}$$

$$= 10\frac{20}{33}$$

$\approx$ 11 rounds (minimal rounds = 11)

(*b*) Radius of large pizza = 14

Area of large pizza $= \pi r^2$

$$= \frac{22}{7} \times (14 \text{ cm})^2$$

$$= \frac{22}{7} \times 196 \text{ cm}^2$$

$$= 616 \text{ cm}^2$$

Radius of small pizza = 7

Area of small pizza $= \pi r^2$

$$= \frac{22}{7} \times (7 \text{ cm})^2$$

$$= \frac{22}{7} \times 49 \text{ cm}^2$$

$$= 154 \text{ cm}^2$$

Area of 2 small pizza $= 2 \times 154 \text{ cm}^2$

$$= 308 \text{ cm}^2$$

616 : 308

2 : 1

$\frac{1}{2}$ large pizza = 2 small pizza

11 (a) Martin: 100 km in 16 seconds

(b) 18 seconds – 9 seconds = 9 seconds

(c) 100 m – 70 m = 30 m

(d) Average speed of Umar $= \dfrac{\text{Distance}}{\text{Time}}$

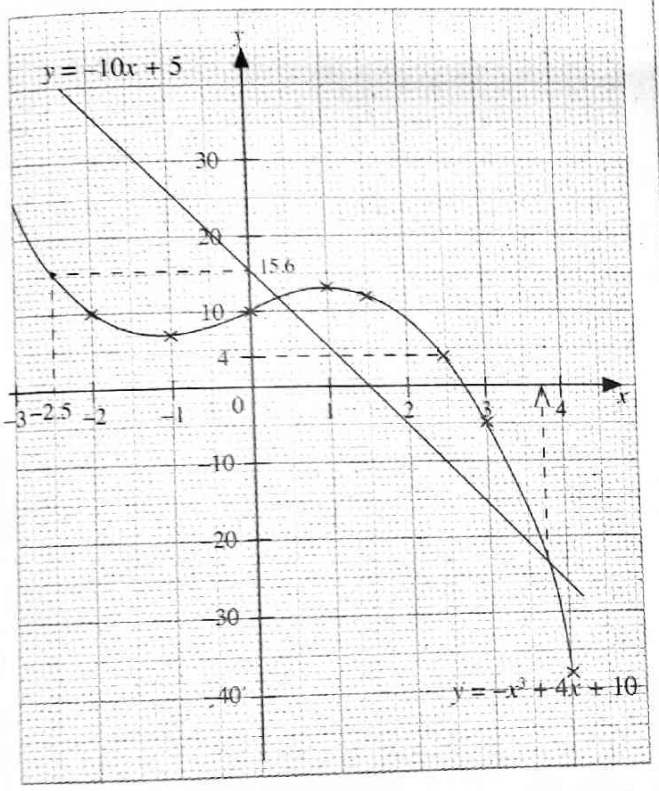
$= \dfrac{100\text{ m}}{20\text{ s}}$

$= 5\text{ m s}^{-1}$

12 (a) $y = -x^3 + 4x + 10$

x	–3	–2	–1	0	1	1.5	2.5	3	4
y	25	10	7	10	13	12.63	4.4	–5	–38

(b)



(c) (i) $y = 15.6$

(ii) $x = 2.4$

(d) $x^3 - 14x + 5 = 0$

$-x^3 + 14x - 5 = 0$

$-x^3 + (4x + 10x) + (10 - 15) = 0$

$-x^3 + 4x + 10 = -10x + 15$

Thus, $y = -10x + 15$

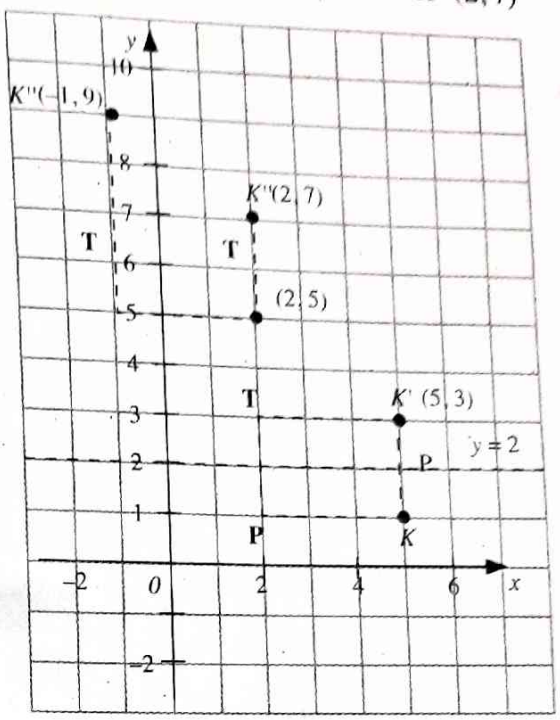
x	0	1
y	15	5

From the graph, the value of x is 0.4 and 3.54

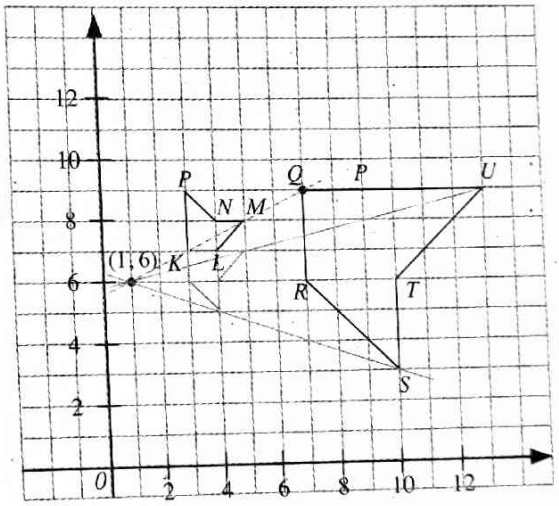
13 (a) (i) $\mathbf{T}^2, \mathbf{TT}, K(5,1) \xrightarrow{\mathbf{T}}$

$K'(2,5) \xrightarrow{\mathbf{T}} K''(-1,9)$

(ii) $\mathbf{TP}, K(5,1) \xrightarrow{\mathbf{P}} K'(5,3) \xrightarrow{\mathbf{T}} K''(2,7)$



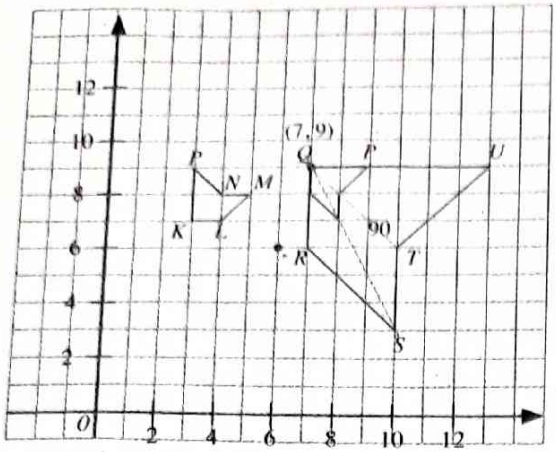
(b) (i) Solution 1



(a) **V** = 90° rotation in clockwise direction at midpoint $K(3,7)$

(b) **W** = enlargement at midpoint (1, 6) with scale factor = 3

Solution 2



(*a*) **V** = 90° rotation in clockwise direction at midpoint (6, 6)

(*b*) **W** = enlargement at midpoint (7, 9) with scale factor = 3

(ii) Area, 90 m^2 = 3^2 × area of object

Area $KLMNP = \frac{90}{9} = 10$ m^2

14 (*a*)

Mass (g)	Frequency	Midpoint
10 – 19	2	14.5
20 – 29	5	24.5
30 – 39	10	34.5
40 – 49	8	44.5
50 – 59	3	54.5
60 – 69	2	64.5

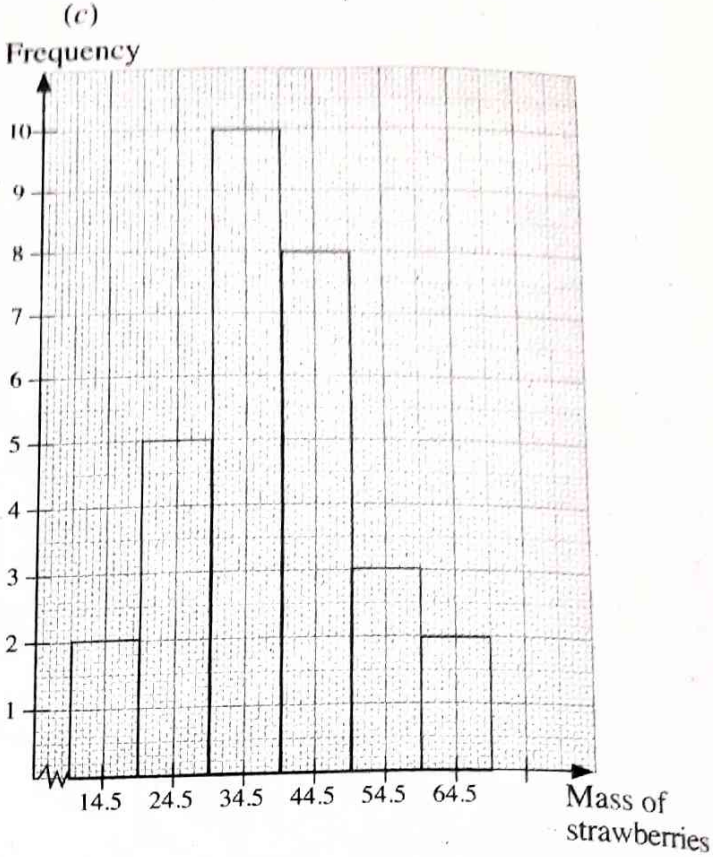
(*b*) Mean $= \frac{\text{Total (midpoint} \times \text{Frequency)}}{\text{Total frequencies}}$

$$= \frac{2(14.5) + 5(24.5) + 10(34.5) + 8(44.5) + 3(54.5) + 2(64.5)}{2 + 5 + 10 + 8 + 3 + 2}$$

$$= \frac{1145}{30}$$

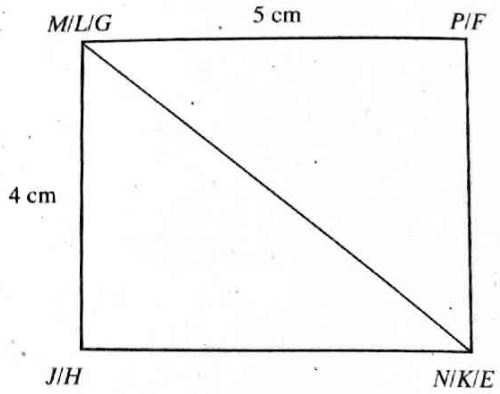
$$= 38.17$$

(*c*)

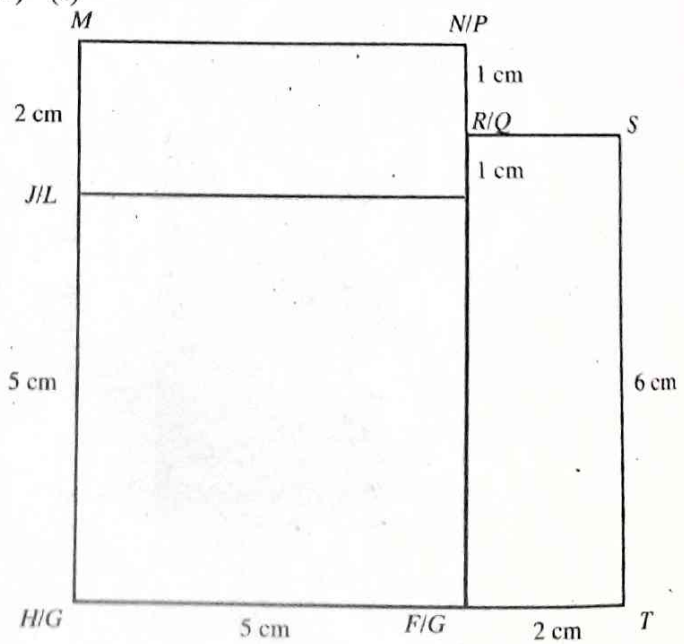


(*d*) The number of strawberries with mass more than 50 g
= 3 +2
= 5

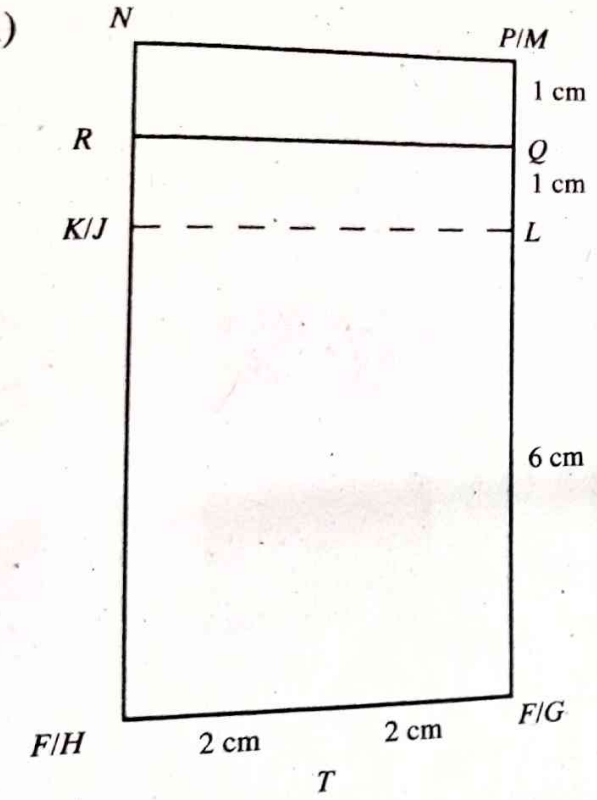
15 (*a*)



(*b*) (i)



(ii)



16 (*a*) (70° *S*, 20° *W*)

(*b*) $\angle MOL = 180° - 50° - 50°$

$= 80°$

Distance *L* to *M* $= 80° \times 60'$

$= 4\,800$ nautical miles

(*c*) Distance *J* to *K*

$= (20° + 120°) \times 60' \times \cos 70°$

$= 140° \times 60' \times \cos 70°$

$= 2872.97$ nautical miles

(*d*) Average speed $= \dfrac{\text{Total distance travelled}}{\text{Total time taken}}$

$800 = \dfrac{x}{5.25}$

$x = 4\,200$ nautical miles

L to *P* $= 4\,200$

Difference between parallel $= y$

$y \times 60 = 4\,200$

$y = 70°$

Thus, latitude of *P* $= 70° - 50°$

$= 20°\ S$