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Answer all the questions.

I (a) Calculate $\frac{12 + \sqrt{27 - 3 \times 3 \times (-2)}}{1.3^2}$

Write down the first five digits on your calculator display.

Answer (a) [1]

(b) Write your answer to part (a) correct to 2 decimal places.

Answer (b) [1]

2 The first four term of a sequence are

12 19 26 33.

(a) Write down the next two terms of the sequence.

Answer (a) [1]

(b) Write down an expression, in terms of n , for the n th term of the sequence.Answer (b) [1]

- 3 Two numbers have HCF = 100 and LCM = 3000. Find the smaller of the two numbers if both numbers are more than 100.

Answer [2]

4

	Singapore	Kuala Lumpur	London
Population	54×10^5	1.70×10^6	8.67×10^6
Area (km^2)	7.19×10^2	2.43×10^2	1.57×10^3

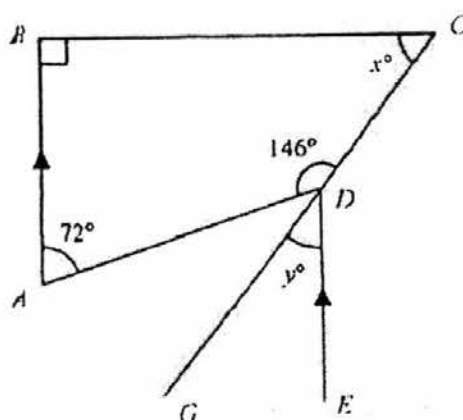
- (a) How many more people live in London than in Singapore?
Give your answer in standard form.

Answer (a) [1]

- (b) Calculate the average number of people per square kilometer in Kuala Lumpur, correct your answer to the nearest thousand.

Answer (b) [1]

- 5 $ABCD$ is a quadrilateral. CDG is a straight line and AB is parallel to ED . $\angle CBA = 90^\circ$, $\angle BAD = 72^\circ$ and $\angle ADC = 146^\circ$, calculate the value of



(a) x ,

Answer (a) $x = \dots\dots\dots [1]$

(b) y .

Answer (b) $y = \dots\dots\dots [1]$

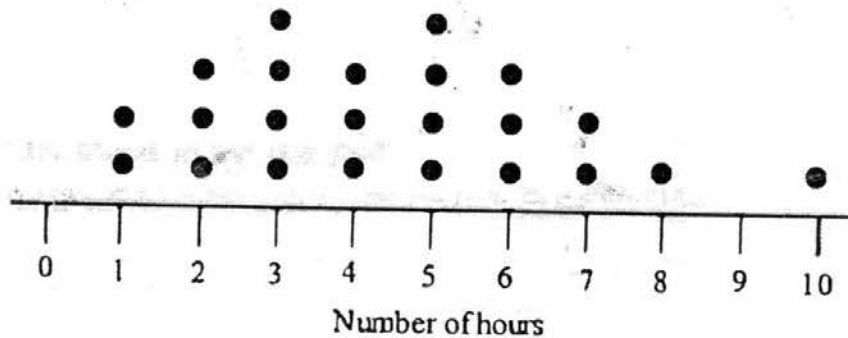
- 6 Find the smallest prime number which satisfies $\frac{2x-8}{3} < \frac{1+2x}{2} - 4$.

Answer $\dots\dots\dots [2]$

- 7 Given that y is proportional to the square of x , x is increased by 50%. Find the percentage increase in y .

Answer [2]

8



A survey was conducted for a week to find out the number of hours that students spent on using their mobile phone apps on weekdays. The data collected was displayed on a dot diagram.

Find

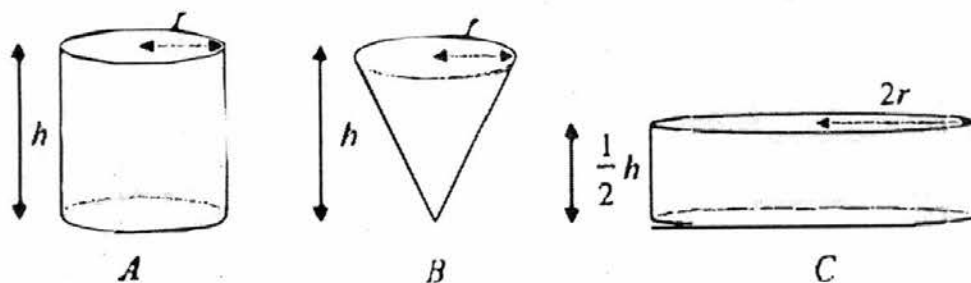
- (a) the range,

Answer (a)hours [1]

- (b) the median number of hours.

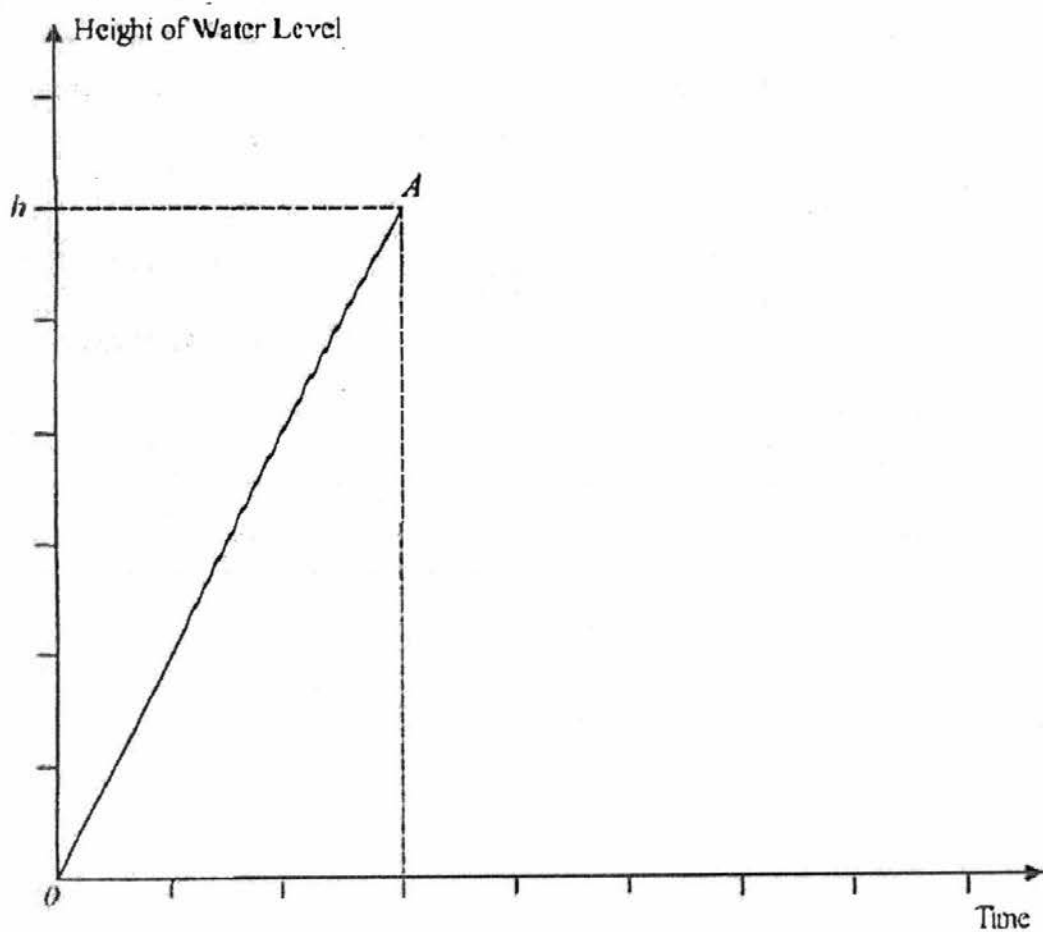
Answer (b)hours [1]

- 9 The diagram shows three containers A , B and C . Water is poured into the three containers at a constant rate until they are completely filled.



In the given axes, OA represents how the height of the water level changes against time for container A .

Draw the graphs to show how the height of the water level changes over time for containers B and C .



Answer

[2]

- 10 On a map, the area of a lake is 0.25 cm^2 . The actual area of the lake is 4 km^2 .
(a) Express the scale of the map in the form $1:n$.

Answer (a) $1:\dots\dots\dots$ [1]

- (b) The distance between two towns A and B is 10 cm on the map. Find the distance between A and B on another map with a scale of $1:250\,000$.

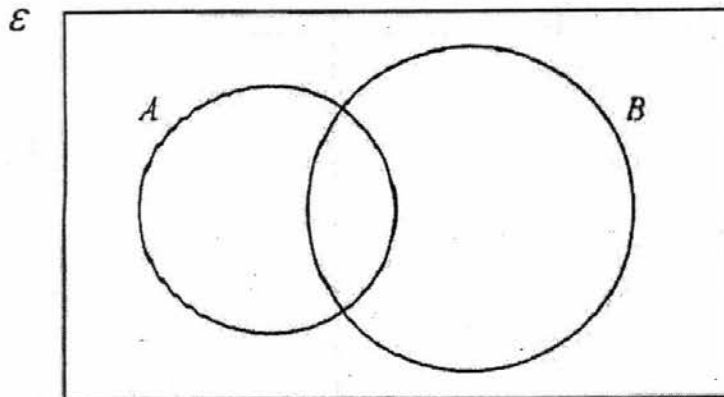
Answer (b) $\dots\dots\dots\text{cm}$ [2]

11 $\xi = \{\text{integers } x: 1 \leq x \leq 16\}$

$A = \{\text{integers that are perfect squares}\}$

$B = \{\text{integers divisible by 2}\}$

- (i) On the Venn Diagram shown below, shade the set $A' \cup B$.



Answer

[1]

- (ii) Write down $n(A' \cap B')$.

Answer (ii).....[1]

- (iii) A number k is chosen from $\mathcal{E}$.
Find the probability that $k \in A \cup B$.

Answer (iii).....[1]

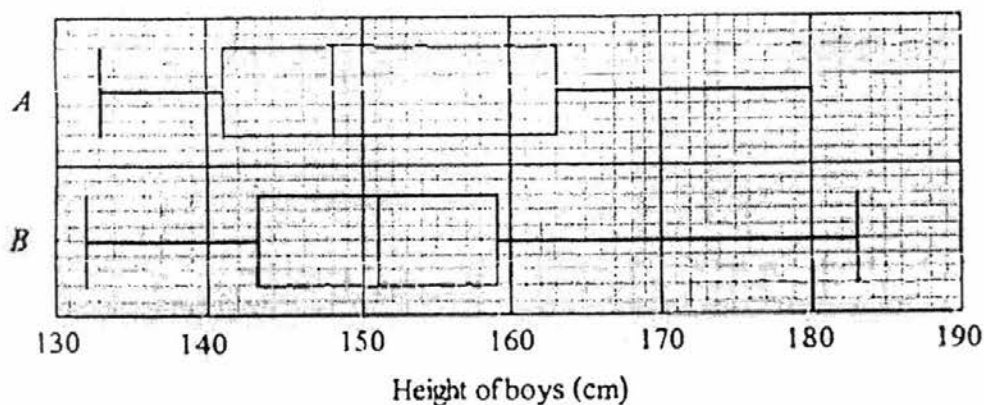
- 12 (a) Factorise completely $xy - 4y - 12 + 3x$.

Answer (a).....[1]

- (b) Factorise completely $(x^2 - 3)^2 + (x^2 - 3) - 2$.

Answer (b).....[2]

- 13 The box plots show the distributions of the heights of a number of boys in two different schools, *A* and *B*.



- (a) Find the interquartile range for school *A*.

Answer (a).....cm[1]

- (b) Here are two statements comparing the heights of boys in the two schools.

For each one, write whether you agree or disagree.

Give a reason for each answer, stating clearly which statistics you use to make your decision.

- (i) On average, boys in school *A* are taller than boys in school *B*.

Answerbecause.....

.....[1]

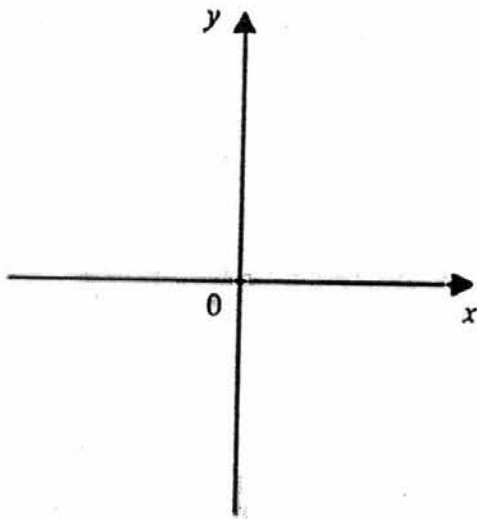
- (ii) More boys are above the height of 160 centimetres in school *B* than in school *A*.

Answerbecause.....

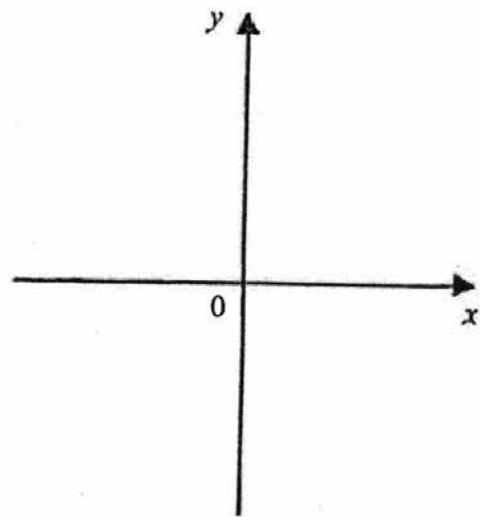
.....[1]

- 14 (a) On the axes, sketch the following graphs, indicating the x and y intercepts if any.

(i) $y = 2^x$



(ii) $y = -\frac{1}{x^2}$



Answer

[2]

- (b) Hence explain why the equation $2^x + \frac{1}{x^2} = 0$ has no solutions.

Answer (b)

.....

..... [1]

- 15 (a) By expressing $-x^2 + 3x + 7$ in the form $-(x-a)^2 + b$, state the equation of the line of symmetry of the graph $y = -x^2 + 3x + 7$.

Answer [2]

- (b) Hence solve the equation $-x^2 + 3x + 7 = \frac{1}{4}$.

Answer (b) $x = \dots\dots\dots$ or $\dots\dots\dots$ [2]

- 16 (a) The value of Mr Lim's car is \$140 000. By the end of the each year, the value of the car decreases by 15% of its value at the start of the year. Find the value of the car at the end of 2 years.

Answer (a) \$..... [2]

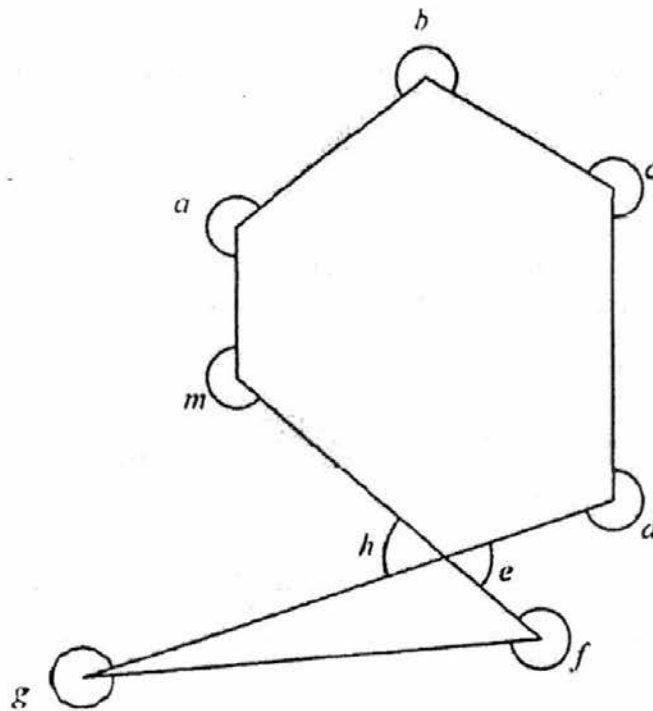
- (b) A car is priced at \$200 000. It can be bought on hire purchase with a down payment of \$40 000, interest rate of 4.5% per annum over 7 years and equal monthly instalment. Find the monthly instalment, correct your answer to the nearest cents.

Answer (b) \$..... [2]

- 17 (a) Calculate the sum of the interior angles of a hexagon.

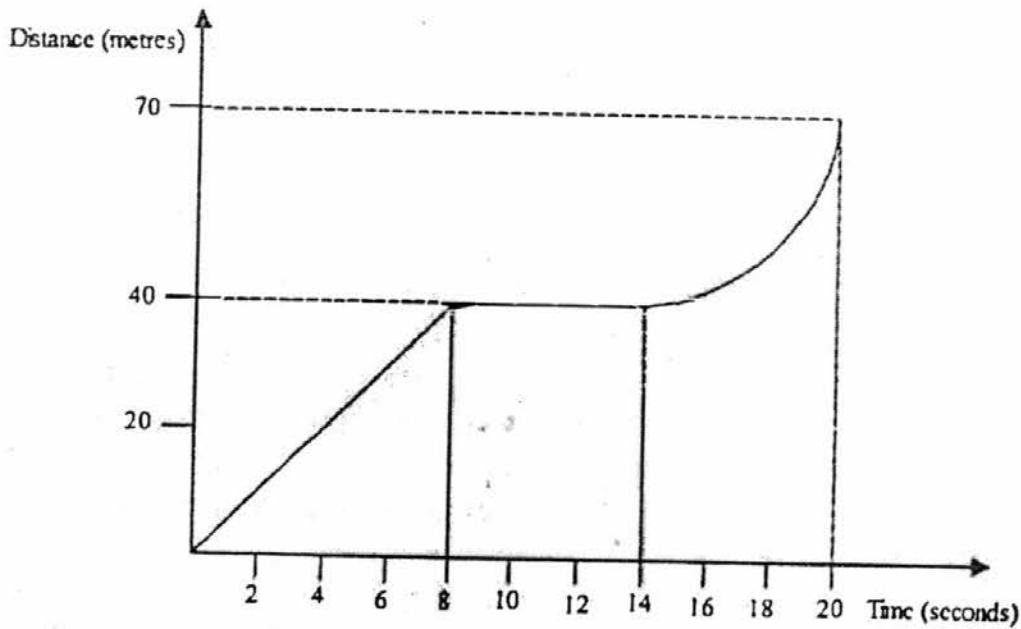
Answer (a)..... $^{\circ}$ [2]

- (b) Calculate the sum of the angles $a, b, c, d, e, f, g, h, m$.



Answer (b)..... $^{\circ}$ [2]

- 18 The diagram shows the distance-time graph for the first 20 seconds of a man running on the track.



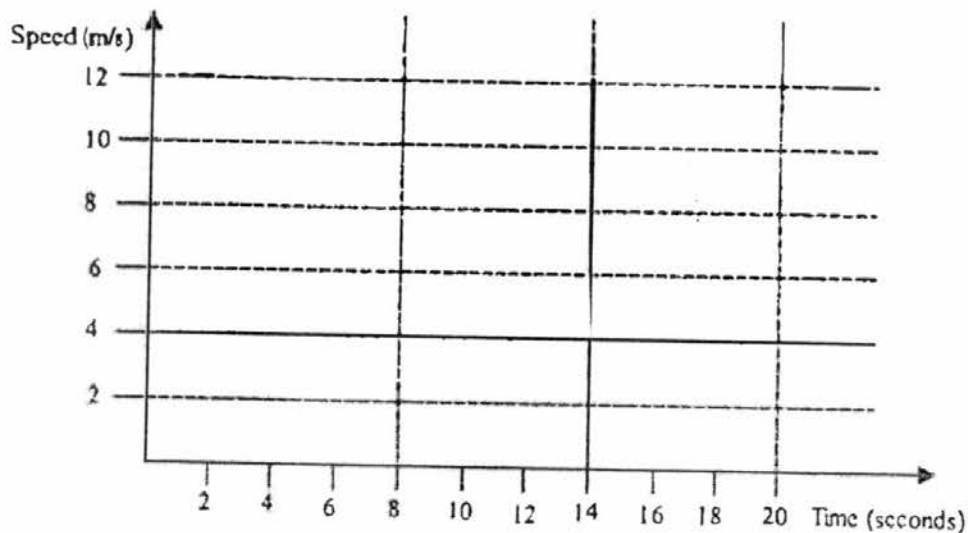
- (a) Find the average speed for the first 10 seconds of the run.

Answer (a).....m/s. [1]

- (b) Convert this speed into km/h.

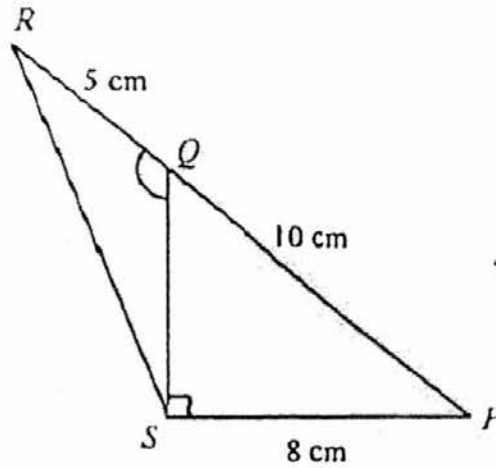
Answer (b).....km/h [1]

- (c) The man accelerates at 2 m/s^2 for the last 6 seconds. On the grid below, sketch the speed-time graph for the run.



[2]

- 19 In the triangle, $PQ = 10$ cm, $PS = 8$ cm and $QR = 5$ cm. Angle PSQ is a right angle and PQR is a straight line.



- (a) Find the value of $\cos \angle RQS$.

Answer (a) $\cos \angle RQS = \dots\dots\dots$ [2]

- (b) Hence, calculate RS .

Answer (b) $RS = \dots\dots\dots$ cm [2]

- 20 The diagram below shows the position of a lighthouse H , a coastguard center A and a patrolling vessel B . The scale is 1 cm to 5 km.



- (a) Construct the perpendicular bisector of AB . [1]

A ship S is on a bearing of 115° from A and 37.5 km from H .

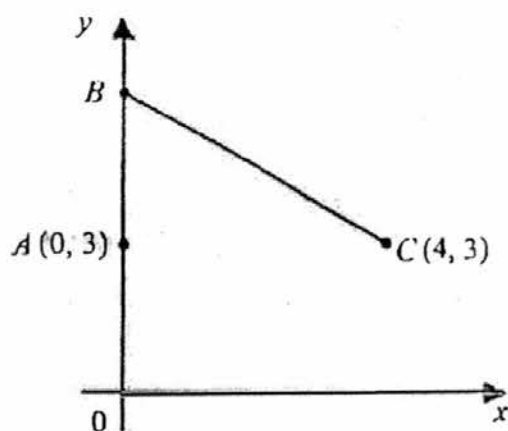
- (b) Find and label the position of the ship S . [2]

- (c) Explain if the ship is nearer to AB or BH .

Answer (c).....

..... [1]

- 21 In the diagram, A and B lie on the y -axis. The equation of BC is $4y + 3x = 24$ and A and C have coordinates $(0, 3)$ and $(4, 3)$ respectively.



- (a) Find the equation of the line parallel to BC passing through A .

Answer (a) [1]

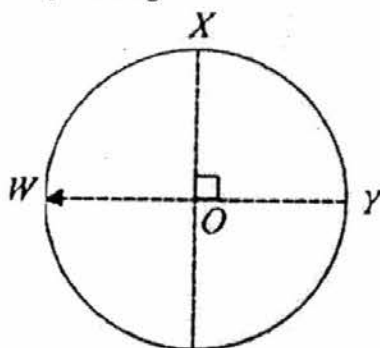
- (b) State the coordinates of D such that $ABCD$ is a parallelogram.

Answer (b) [1]

- (c) Calculate the shortest distance between BC and AD .

Answer (c)units [2]

- 22 (a) The diagram shows a circular disc with a spinner fixed at centre O . An unbiased die is thrown. If 1 or 2 is thrown, the spinner is rotated 90° clockwise; otherwise it is rotated 90° anticlockwise. Given initially the spinner points to W , write down, as a fraction the probability that the spinner is pointing



- (i) to position X after 1 throw,
 (ii) to position Y after 2 throws.

Answer (a)(i) [1]

(a)(ii) [1]

- (b) Three unbiased dice are thrown together. Find the probability that
 (i) all the dice show different number,
 (ii) at least two dice show the same number.

Answer (b)(i) [1]

(b)(ii) [1]

- 23 (a) Solve the simultaneous equations

$$\frac{3}{x} + \frac{2}{y} = 5,$$

$$\frac{1}{x} + \frac{1}{y} = 4.$$

Answer (a) $x = \dots\dots\dots$, $y = \dots\dots\dots$ [3]

- (b) Given that $x = 2$ is a solution of the equation $2x^2 - 5x + k = 0$, where k is a constant,

Find

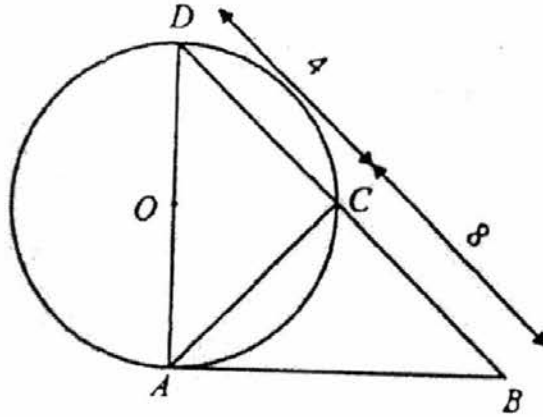
- (i) the value of k ,

Answer (i) $k = \dots\dots\dots$ [1]

- (ii) the other solution of the equation.

Answer (ii) $x = \dots\dots\dots$ [1]

- 24 In the diagram, AD is the diameter of the circle with centre O , AB is a tangent to the circle at A and BCD is a straight line.



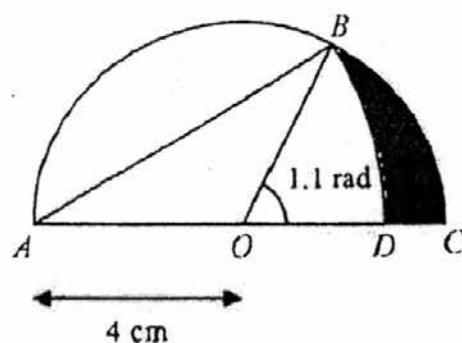
- (a) State a reason why $\angle ACD$ is 90° .

Answer (a).....
 [1]

- (b) Given that $BC = 8$ cm, $CD = 4$ cm and $AC = h$ cm. Find the length of AD .

Answer (b)cm[4]

- 25 $ABCD$ is a semi-circle with diameter AC , centre O and radius of 4 cm. ABD is a sector with centre A . Given that $\angle BOD = 1.1$ rad, find



- (a) the length of arc BD ,
 (b) perimeter of shaded region.

Answer (a) $BD = \dots\dots\dots$ cm [3]
 (b) $\dots\dots\dots$ cm [2]

Answer all the questions.

1 (a) 9.2052

(b) 9.21

2 (a) 40, 47

(b) $7n+5$

3 The smaller number is 300 or 200.

4 (a) 3.27×10^6

(b) 7000

5 (a) $x^\circ = 52^\circ$

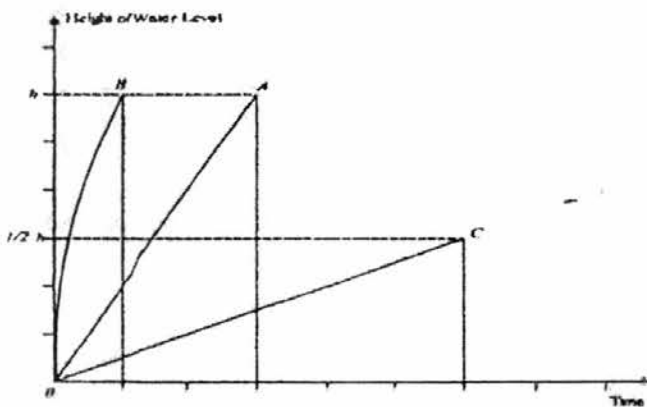
(b) $y^\circ = 38^\circ$

6 Smallest prime number is 3.

7 125%

8 (a) $10-1=9$ hours

(b) median = 4 hours

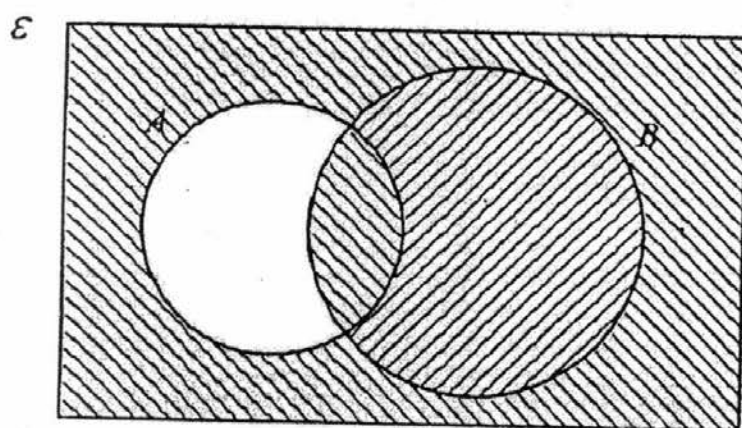


9

10 (a) 1 : 400 000

(b) 40 km : 16 cm

11 (i)



Answer

[1]

(ii) $n(A' \cap B') = 6$

(iii) probability = $\frac{10}{16} = \frac{5}{8}$

12 (a) $(y+3)(x-4)$

(b) $(x+1)(x-1)(x+2)(x-2)$

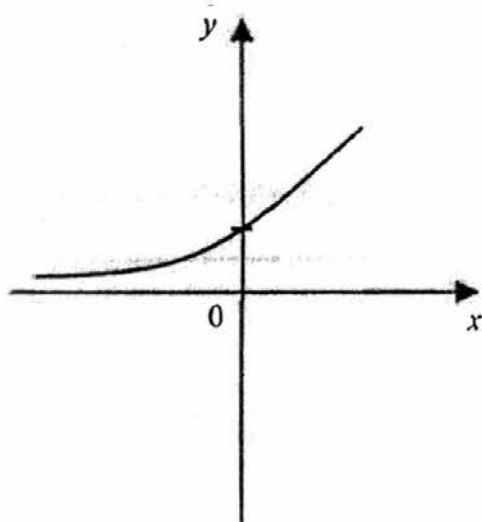
13 (a) $163 - 141 = 22$

(b) (i) I disagree because the mean height of boys in school A is less than the mean height of boys in school B.

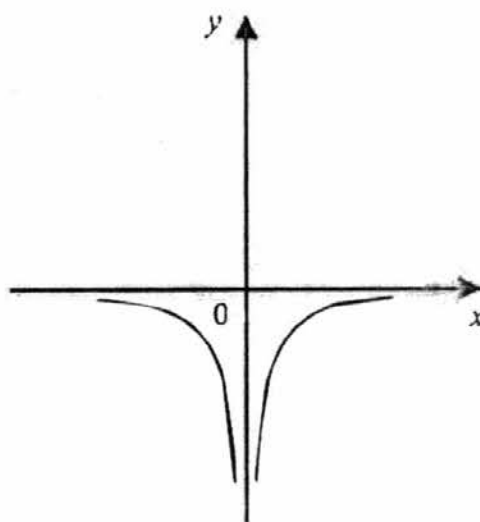
(ii) I disagree because boys in school A has a higher upper quartile. More than 25% of boys in school A has a height above 1.60 m but less than 25% of the boys in school B has a height above 1.60 m.

14 (a) On the axes given, sketch the following graphs, indicating the x and y intercepts if any.

(i) $y = 2^x$



(ii) $y = -\frac{1}{x^2}$



Answer

[2]

(b) Hence explain why the equation $2^x + \frac{1}{x^2} = 0$ has no solutions.

$$2^x = -\frac{1}{x^2}$$

Answer (b) Since both graphs do not intersect each other, the equation has no solutions.

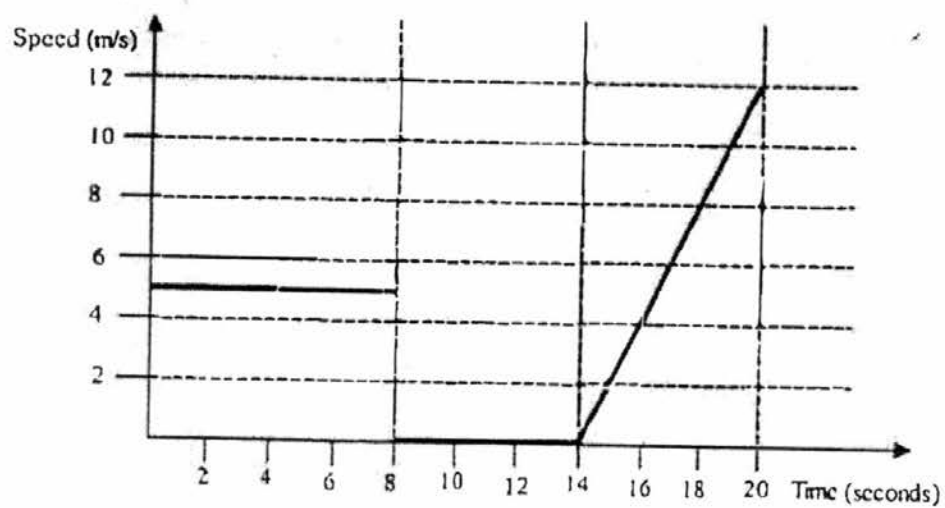
[1]

- 15 (a) $x = 1.5$
- (b) $x = 4.5$ or $x = -1.5$
-

- 16 (a) \$101 150
- (b) \$2504.76
-

- 17 (a) 720°
- (b) 1980°
-

- 18 (a) average speed = $\frac{40}{10} = 4 \text{ m/s}$
- (b) 14.4 km/h
- (c) The man accelerates at 2 m/s^2 for the last 6 seconds. On the grid below, sketch the speed-time graph for the run.



[2]

- 19 (a) $-\frac{3}{5}$
(b) 9.85 cm
-

- 20 (c) Ship S is nearer to BH because it is between the angle bisector and the line BH .
-

- 21 (a) Equation of line is $y = -\frac{3}{4}x + 3$.
(b) Coordinates of D is $(4, 0)$.
(c) 2.4 units
-

- 22 (a) (i) $P(\text{spinner at } X \text{ after 1 throw}) = \frac{2}{6} = \frac{1}{3}$
(ii) $P(\text{spinner at } Y \text{ after 2 throws}) = \frac{5}{9}$
(b) (i) $P(\text{all the dice show different number}) = \frac{5}{9}$
(ii) $P(\text{at least two dice show the same number}) = \frac{4}{9}$
-

- 23 (a) $x = -\frac{1}{3}, y = \frac{1}{7}$
(b) (i) $k = 2$
(ii) $x = \frac{1}{2}$
-

- 24 (a) $\angle ACD = 90^\circ$ because it is the angle in a semi-circle.
(b) $AD = 6.93$ cm
-

- 25 (a) 3.75 cm
(b) 9.33 cm

Answer all the questions.

- 1 A shop sells two flavours of ice cream, Cherry and Durian. Each flavour is sold in cups of three different sizes, small, medium and large at \$2.50, \$3.20 and \$4.50 respectively. The sales in two successive days are given in the table below.

	Saturday			Sunday		
Size	Small	Medium	Large	Small	Medium	Large
Number of cups of Cherry sold	12	17	8	14	12	10
Number of cups of Durian sold	18	15	11	13	21	16

The information for Saturday's sale can be represented by the matrix,

$M = \begin{pmatrix} 12 & 17 & 8 \\ 18 & 15 & 11 \end{pmatrix}$ and the cost of each flavour for each size can be represented by the

matrix $C = \begin{pmatrix} 2.5 \\ 3.2 \\ 4.5 \end{pmatrix}$. The information for the Sunday's sale can be represented by the

matrix N .

- Write down the matrix N and calculate $P = M + N$. [2]
 - Describe what the elements of P represent. [1]
 - Calculate $Q = PC$. [2]
 - Describe what the elements of $\frac{1}{2}Q$ represent. [1]
 - Write down the matrix S such that the elements of SPC represent the total amount received from the sales of the ice cream. [1]
-

- 2 (i) Issac typed 20 pages of a research journal at an average speed of x pages per hour. Write down an expression, in terms of x , for the number of hours he took to type 20 pages. [1]
- (ii) Lucas typed at an average speed that was 2 pages per hour faster than Isaac's typing speed. Write down an expression, in terms of x , for the number of hours Lucas took to type 20 pages. [1]
- (iii) Given that the difference between the two timings were 24 minutes, write down an expression, in terms of x and show that it simplifies to $x^2 + 2x - 100 = 0$. [3]
- (iv) Solve the equation $x^2 + 2x - 100 = 0$, giving your solutions correct to one decimal place. [3]
- (v) Hence, find the time taken by Lucas to type 20 pages. Give your answer in hours and minutes, correct to the nearest minutes. [1]
-
- 3 (a) Simplify $\left(\frac{3x^2}{4y}\right)^{-2} \div \frac{y^4}{9x^3}$ [2]
- (b) Simplify $\frac{2x - x^2}{x^2 - 5x + 6}$. [2]
- (c) Make r the subject of the formula $\frac{p}{2q} = \left(\frac{r}{3s-1}\right)^2$. [2]
- (d) Solve the equation $\frac{7}{(x-2)^2} - \frac{2}{2-x} = \frac{2}{3}$. [4]
-

- 4 (a) Adam exchanged 5000 Singapore Dollars (SGD) into British Pounds (GBP) at the bank. The bank's exchange rates are given below.

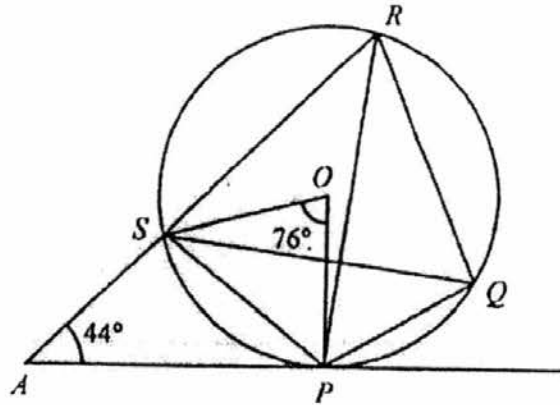
Singapore Dollars (SGD) to 1 unit of British Pounds (GBP)	Buying	Selling
	2.44	2.50

- (i) Find the amount of British Pounds that Adam received. [1]
- (ii) He then invested the British Pounds in a bank for three years which paid an interest of 4% compounded half-yearly. Find out the amount of money Adam received, in British Pounds, correct to two decimal places, at the end of three years. [2]
- (iii) Adam exchanged the British pounds back to Singapore Dollars at a new exchange rate of 2.10 (SGD) to 1 (GBP). Find the amount in Singapore Dollars that Adam received, correct to the nearest cent. Hence calculate his percentage loss at the end of his investment. [3]
- (b) In a club, each member present shakes hands just once with every other member.
- (i) Suppose there are only 2 members present. How many handshakes are involved? [1]
- (ii) Copy and complete the following table. [1]

Number of members in the club	Number of handshakes
1	
2	
3	
4	
5	

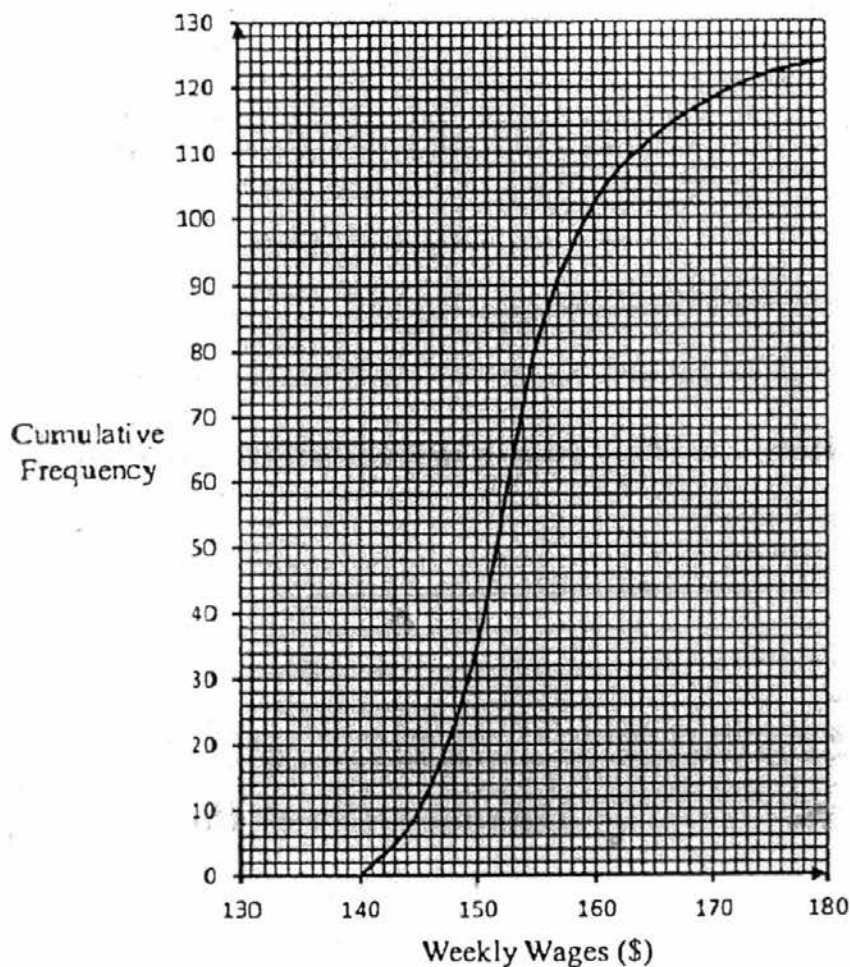
- (iii) How many handshakes will be involved if there are n number of members? [1]
- (iv) Explain, with a reason, if it is possible to have 204 handshakes. [1]
-

- 5 In the diagram, O is the centre of the circle $PQRS$ and $\angle POS = 76^\circ$. AP is a tangent to the circle at P . RS is produced to A such that $\angle PAS = 44^\circ$.



- (a) Calculate, stating your reasons clearly,
- | | |
|----------------------|-----|
| (i) $\angle PRS$, | [1] |
| (ii) $\angle SQP$, | [1] |
| (iii) $\angle SPA$, | [1] |
| (iv) $\angle PQR$, | [2] |
| (v) $\angle RPO$. | [3] |
- (b) Given that the radius of the circle is 6 cm, calculate the length of chord PR . [2]
-

- 6 The cumulative frequency curve below shows the weekly wages of 124 workers in a company.

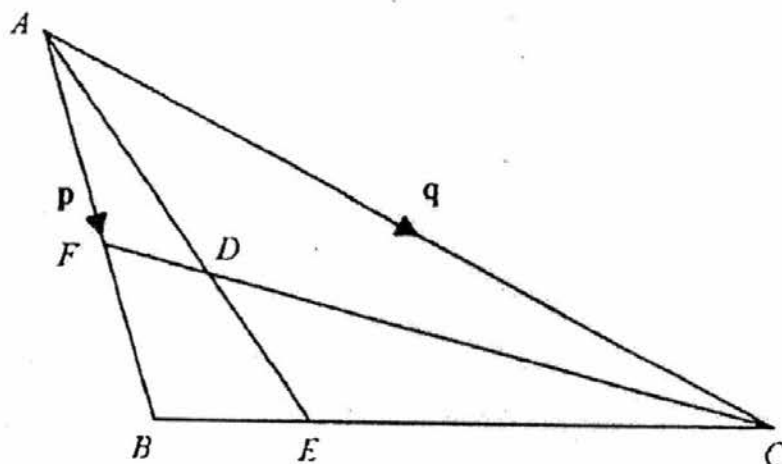


- (a) Copy and complete the grouped frequency table of the weekly wages of the workers. [2]

Weekly wage (\$)	$130 < x \leq 140$	$140 < x \leq 150$	$150 < x \leq 160$	$160 < x \leq 170$	$170 < x \leq 180$
Number of workers	0		68		6

- (b) Using your grouped frequency table, calculate an estimate of the
- mean weekly wages of the workers, [1]
 - standard deviation. [2]
- (c) Two workers are chosen at random in the company, one after another. Find as a fraction in its simplest form, the probability that
- both workers earn a weekly wage of at most \$150, [2]
 - one worker earns more than \$170 but another earns at most \$160. [2]
- (d) Another company of 124 workers have the same median weekly wages but a smaller interquartile range. Describe how the cumulative frequency curve will differ from the given curve. [1]

- 7 In the diagram, F is the midpoint of AB . E is the point on BC such that $4BE = BC$.
 $\overrightarrow{AB} = \mathbf{p}$ and $\overrightarrow{AC} = \mathbf{q}$.



- (a) Express as simply as possible, in terms of $\mathbf{p}$ and/or $\mathbf{q}$,
- $\overrightarrow{BC}$, [1]
 - $\overrightarrow{EC}$, [1]
 - $\overrightarrow{AE}$, [1]
 - $\overrightarrow{FC}$. [1]
- (b) It is given that $\overrightarrow{CD} = h\overrightarrow{CF}$. Express the vector $\overrightarrow{AD}$ as simply as possible, in terms of h , $\mathbf{p}$ and $\mathbf{q}$. [1]
- (c) It is given that $\overrightarrow{AD} = k\overrightarrow{AE}$, find the value of h and of k . [3]
- (d) Find the numerical value of
- $\frac{\text{Area of } \triangle AFD}{\text{Area of } \triangle AFC}$, [1]
 - $\frac{\text{Area of } \triangle CDE}{\text{Area of } \triangle ADF}$. [2]
-

8 Answer the whole of this question on a sheet of graph paper.

The variables x and y are connected by the equation

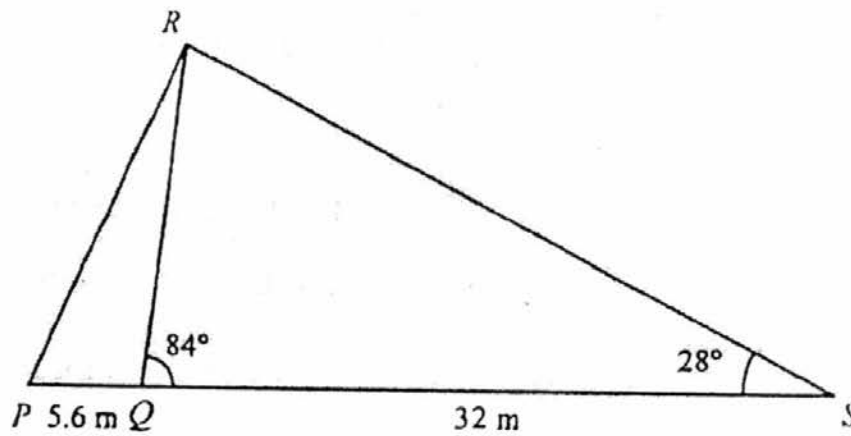
$$y = x - \frac{x^2}{2} - \frac{x^3}{5}.$$

Some corresponding values of x and y are given in the following table.

x	-4	-3	-2	-1	0	0.5	1	2	3
y	0.8	-2.1	-2.4	-1.3	0	0.35	0.3	p	-6.9

- (a) Calculate the value of p . [1]
- (b) Using a scale of 2 cm to represent 1 unit, draw a horizontal x -axis for $-4 \leq x \leq 3$.
Using a scale of 2 cm to represent 1 unit, draw a vertical y -axis for $-7 \leq y \leq 1$.
On your axes, plot the points given in the table and join them with a smooth curve. [3]
- (c) Use your graph to find the three solutions of the equation $x - \frac{x^2}{2} - \frac{x^3}{5} = 0$. [2]
- (d) By drawing a tangent, find the gradient of the curve at $x = 1.5$. [2]
- (e) By drawing a suitable straight line on your graph, solve $3x - \frac{x^2}{2} - \frac{x^3}{5} + 4 = 0$. [3]
-

- 9 PQ is the width of a rugby goal post at one end of a rugby pitch. S is position of the corner flag. P , Q and S lie on a straight line with $PQ = 5.6$ m and $QS = 32$ m. A player is spotted at R , such that $\angle RQS = 84^\circ$ and $\angle RSQ = 28^\circ$.



- (a) Calculate
- (i) the distance RS , [2]
 - (ii) the distance RP , [3]
 - (iii) $\angle PRQ$. [2]
- (b) A flying drone capturing the gameplay is hovering at a height of 15 m directly above S . Find the angle of elevation of the drone from the player R . [2]
- (c) The player at R wishes to run to line QS in the fastest time. Calculate the distance that the player should run. [2]
-

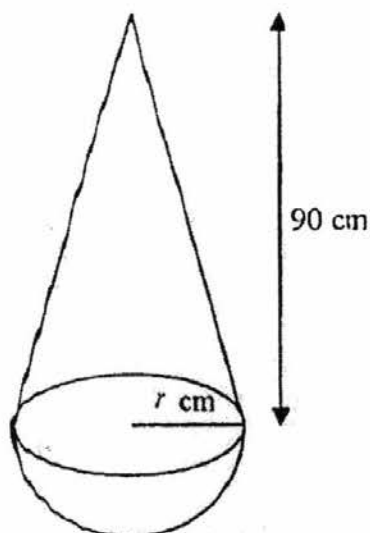


Figure A

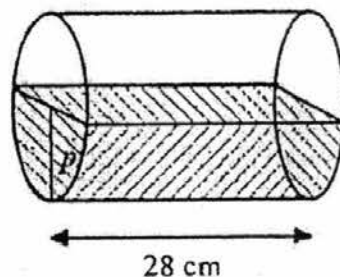


Figure B

- (a) Figure A shows a hollow container which is made up of a hemispherical bowl of radius r cm and a right circular cone of radius r cm and height 90 cm. The capacity of the right circular cone is 4 times that of the hemispherical bowl.
- Find the value of r . [2]
 - Find the total exterior surface area of the container. [3]
 - The container is completely filled with water. Calculate the volume of the water in the container. [2]
- (b) Figure B shows a cylindrical container which is resting on a horizontal surface. The cylinder has radius p cm and length 28 cm.
- If all the water from container in Figure A is poured into the container in Figure B, it will fill up to exactly half of the capacity of cylinder in Figure B. Calculate the value of p . [2]
 - Find the total surface area of the container in Figure B which is in contact with water. [2]
-

Answer *all* the questions.

- 1 (a) $\begin{pmatrix} 26 & 29 & 18 \\ 31 & 36 & 27 \end{pmatrix}$
- (b) Total number of small, medium and large cups of cherry and durian ice-cream sold on Saturday and Sunday.
- (c) $\begin{pmatrix} 238.8 \\ 314.2 \end{pmatrix}$
- (d) The average amount received from selling both cherry and durian ice-cream on Saturday and Sunday.
- (e) $S = \begin{pmatrix} 1 & 1 \end{pmatrix}$

- 2 (i) $\frac{20}{x}$ hours
- (ii) $\frac{20}{x+2}$ hours
- (iii) $\frac{20}{x} - \frac{20}{x+2} = \frac{24}{60}$
- (iv) $x = 9.0$ or $x = -11.0$
- (v) Time taken = $\frac{20}{9.04 + 2} = 1$ hour 49 minutes

- 3 (a) $\frac{16}{xy^2}$
- (b) $\frac{x}{3-x}$
- (c) $r = \pm(3s-1)\sqrt{\frac{p}{2q}}$
- (d) $x = -0.0707$ or $x = 7.07$

- 4 (a)(i) Adam recieved = $5000 \div 2.50 = 2000$ GBP
- (a)(ii) Adam received = 2252.32 GBP
- (a)(iii) 5.40%
- (b)(i) 1 handshake
- (b)(ii)

Number of members in the club	Number of handshakes
1	0
2	1

3	3
4	6
5	10

(b)(iii) $\frac{n(n-1)}{2}$

(b)(iv)

Since $n = -19.7$ or $n = 20.7$ is not a whole number, it is not possible to have 204 handshakes.

- 5 (a)(i) $\angle PRS = 38^\circ$
 (a)(ii) $\angle SQP = \angle PRS = 38^\circ$
 (a)(iii) $\angle SPA = \angle SQP = 38^\circ$
 (a)(iv) $\angle PQR = 98^\circ$
 (a)(v) 8°
 (b) $PR = 11.9 \text{ cm}$

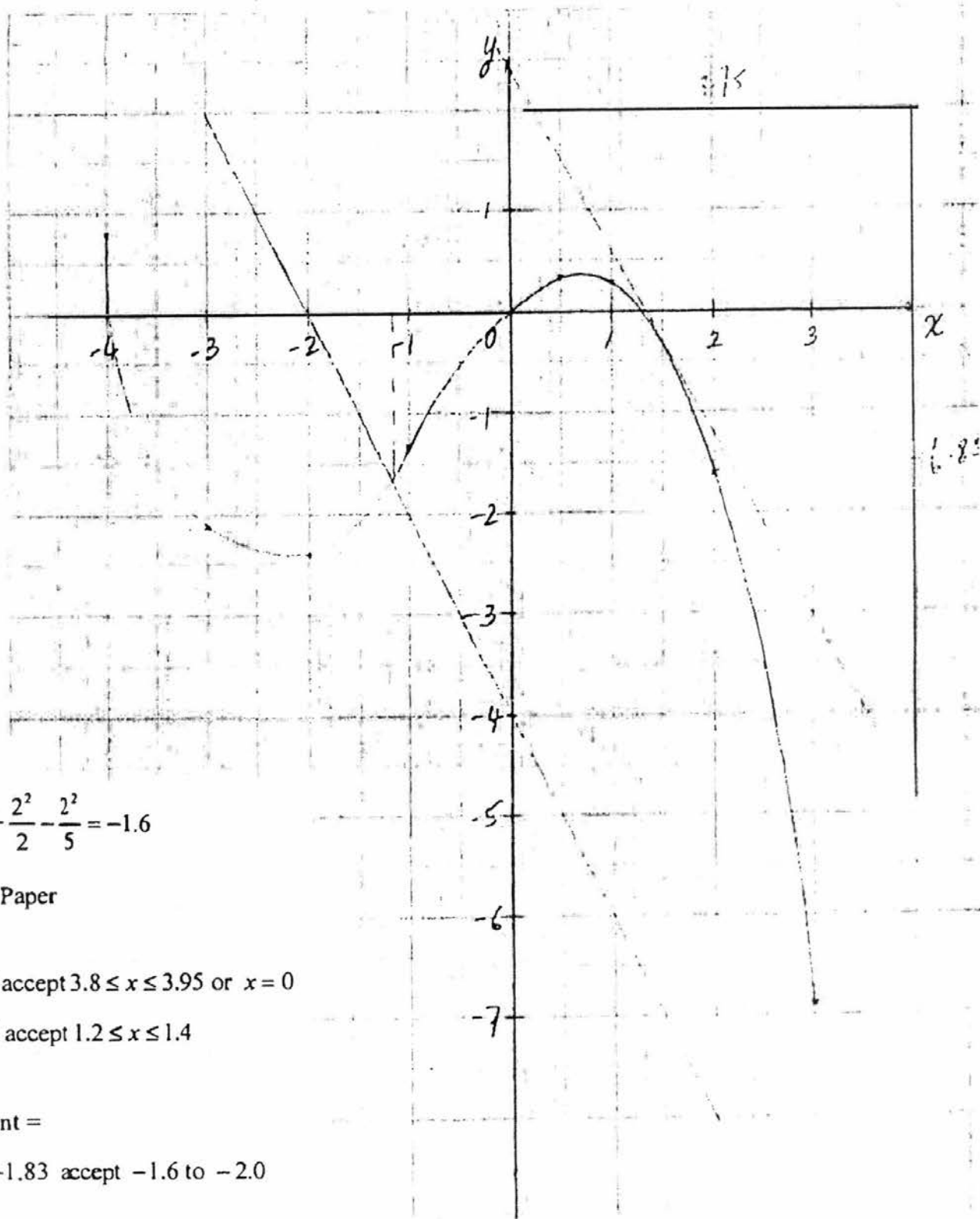
- 6 (a) $p = 34$ or 35 , $q = 16$
 (b)(i) Mean = \$154.51
 b(ii) SD = \$7.71

(c)(i) $P(\text{Both workers earned at most } \$150) = \frac{595}{7626}$

(c)(ii) $P(\text{One worker earned more } \$170 \text{ but the other at most } \$160) = \frac{102}{1271}$

(d) The cumulative curve will be steeper.

- 7 (a)(i) $q - p$
 (a)(ii) $\frac{3}{4}(q - p)$
 (a)(iii) $\frac{3}{4}p + \frac{1}{4}q$
 (a)(iv) $q - \frac{1}{2}p$
 (b) $\frac{1}{2}hp - (h-1)q$
 (c) $k = \frac{4}{7}$, $h = \frac{6}{7}$
 (d)(i) $\frac{1}{6}$ (d)(ii) $\frac{9}{2}$



(a) $p = 2 - \frac{2^2}{2} - \frac{2^2}{5} = -1.6$

(b) Graph Paper

(c)

$x = -3.95$ accept $3.8 \leq x \leq 3.95$ or $x = 0$

or $x = 1.3$ accept $1.2 \leq x \leq 1.4$

(d) Gradient =

$$-\frac{6.85}{3.75} = -1.83 \text{ accept } -1.6 \text{ to } -2.0$$

(e) Draw line $y = -2x - 4$

$x = -1.15$ accept $-1.1 \leq x \leq -1.25$

$$y = -2x - 4$$

9

(a)(i) 34.3 m (ii) 17.7 m (iii) 18.4° (b) 23.6°

(c) 16.1 m

10

(a)(i) 11.25

(a)(ii) 4000 cm^2 (a)(iii) 14910 cm^3

(b)(i) 18.4

(b)(ii) 2684 cm^2