

For
Examiner's
use

For
Examiner's
use

Section A [50 marks]

ELECTRONIC CALCULATORS MUST NOT BE USED IN THIS PAPER

1 Express 0.385

- (a) as a decimal, correct to 2 significant figures,
- (b) as a fraction in its lowest terms.

Answer (a) [1]

(b) [1]

2 Consider the following numbers

$-1, 0, \frac{2}{3}, \pi, 4, \sqrt{21}, 6.6.$

Write down

- (a) the integers,
- (b) the irrational numbers.

Answer (a) [1]

(b) [1]

For
Examiner's
use

For
Examiner's
use

3 Find the value of

(a) $(2-3) + (-1)^3$,

(b) $-2\frac{4}{5} \times 6\frac{2}{7} \div \frac{11}{7}$.

Answer (a) [1]

(b) [2]

4 (a) Given that $3 : x = 5 : 8$, find the value of x .

(b) The number of red marbles to yellow marbles is $5 : 6$ and the number of red marbles to blue marbles is $7 : 8$. Find the ratio of the number of yellow marbles to blue marbles.

Answer (a) [2]

(b) [2]

For
Examiner's
use

For
Examiner's
use

- 5 (a) Express 3969 as a product of its prime factors and give your answer in index notation.
- (b) Hence or otherwise, find the square root of 441.

Answer (a) [2]

(b) [1]

-
- 6 Using the result $20.4 \times 12.5 = 255$, find the exact value of

(a) 40.8×12.5 ,

(b) $255 \div 37.5$.

Answer (a) [2]

(b) [2]

For
Examiner's
use

For
Examiner's
use

7 Simplify

(a) $3a(2a-1) - 2a(2-4a)$,

(b) $\frac{6xy^3}{4} \times \left(\frac{5}{-x}\right)^2 \times \frac{x}{y^2}$.

Answer (a) [2]

(b) [2]

8 Express the following as a single fraction in its simplest form

(a) $\frac{3}{x} + \frac{4}{2x} + \frac{5}{3x}$,

(b) $\frac{4+x}{3} - \frac{6x-3}{4} - 1$.

Answer (a) [2]

(b) [2]

For
Examiner's
use

For
Examiner's
use

9 (a) Solve the equation $\frac{3x+6}{7} - 4 = 0$.

(b) Given that $a = 3$, $b = 1$, $c = -1$, find the value of $\left(\frac{a}{b} + \frac{c}{a}\right)\left(\frac{c}{a+b}\right)$.

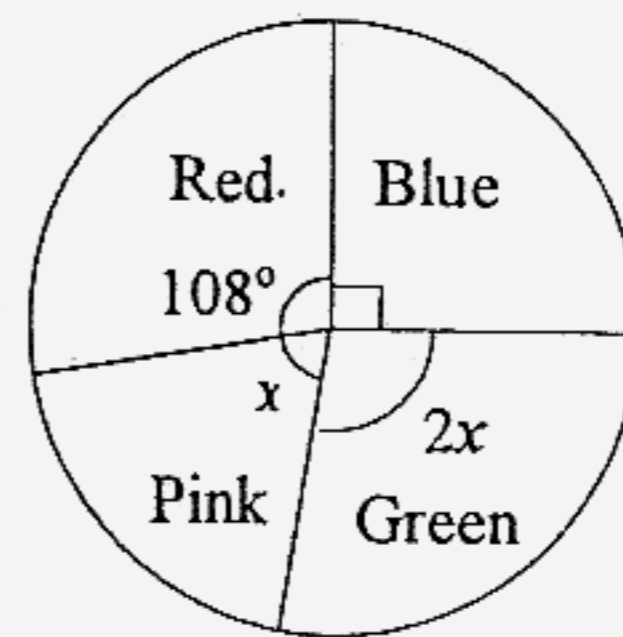
Answer (a) [2]

(b) [2]

10 A survey was conducted on a class of 40 pupils to find out their favourite colour.

(a) How many pupils chose pink as their favourite colour?

(b) Later in the year, 3 pupils joined the class and they said their favourite colour is pink. What is the percentage increase in the number of pupils who chose pink as their favourite colour?



Answer (a) [2]

(b) [2]

For
Examiner's
use

For
Examiner's
use

11 In an n -sided polygon, three of the interior angles are 120° each and the other exterior angles are 20° each. Find

- (a) the value of n ,
- (b) the sum of the interior angles of this polygon.

Answer (a) [2]

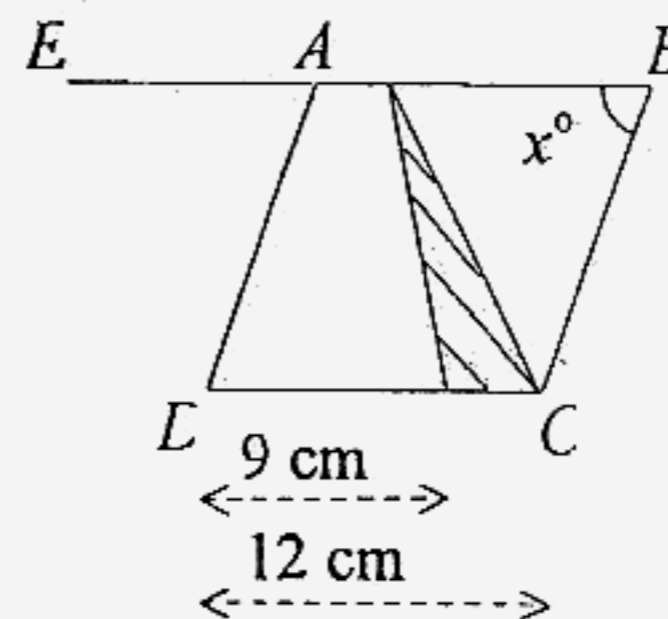
(b) [2]

12 In the given figure, $ABCD$ is a rhombus of side 12 cm and it has an area of 132 cm^2 . Given that EAB is a straight line, find in terms of x

- (a) $\angle EAD$,
- (b) $\angle ACD$.

The rhombus contains a shaded triangle.

- (c) Find the area of the shaded triangle.



Answer (a) $\angle EAD =$ [1]

(b) $\angle ACD =$ [2]

(c) [2]

For
Examiner's
use

- 13 Town Wonderful and Town Beautiful are 500 km apart. At 10 am, Car A set off from Town Wonderful for Town Beautiful at 60 km/h and Car B set off from Town Beautiful for Town Wonderful at 90 km/h. Given that they travelled on the same road, at what time did both cars meet?

For
Examiner's
use

Answer [4]

For
Examiner's
use

For
Examiner's
use

14 A series of diagrams of shaded and unshaded small triangles is shown below.
Find

- (a) the number of small shaded triangles in Diagram 4,
(b) the number of small shaded triangles in Diagram n .

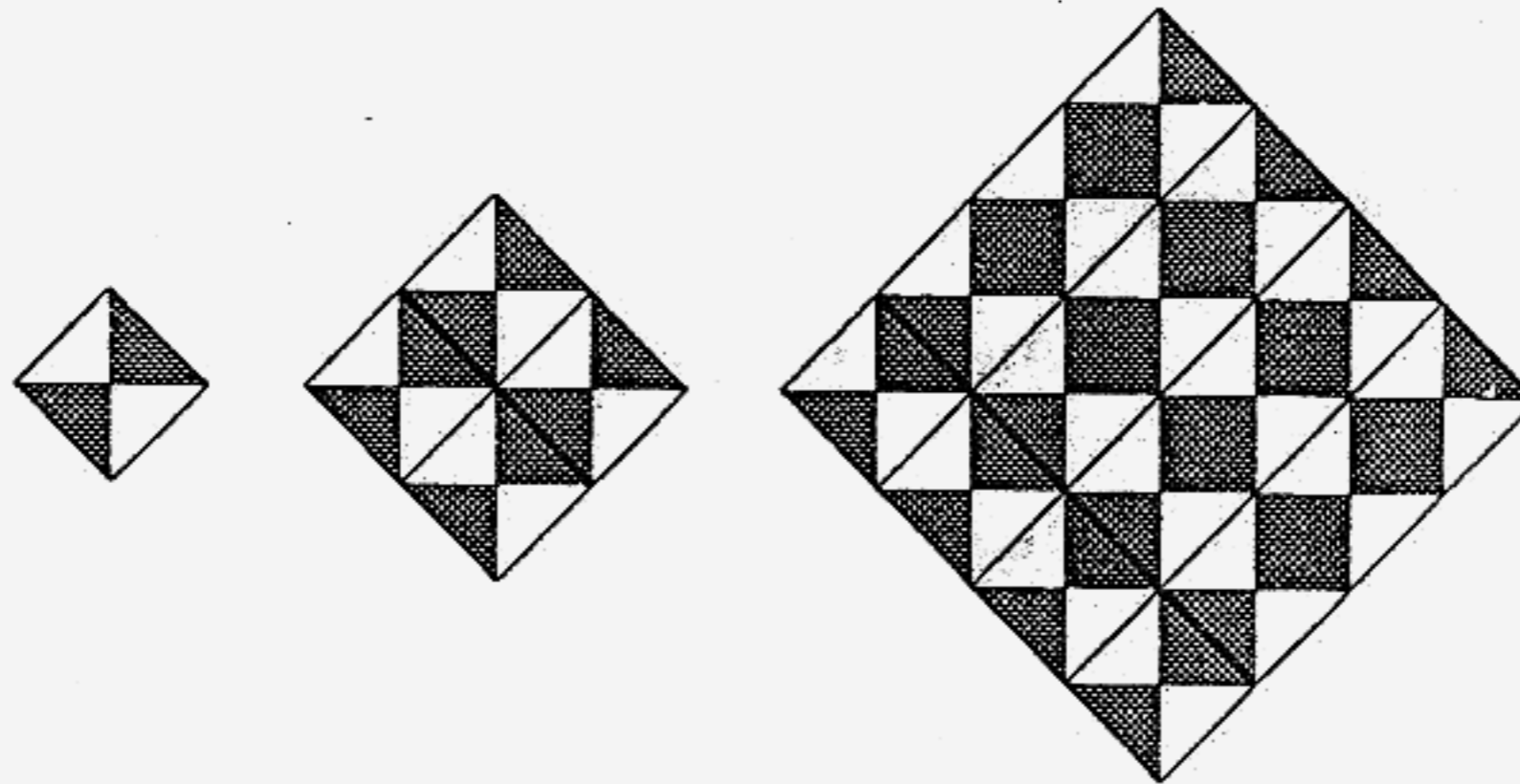


Diagram 1

Diagram 2

Diagram 3

Diagram	1	2	3	4		n
Number of small shaded triangles	2	8	32	?		?

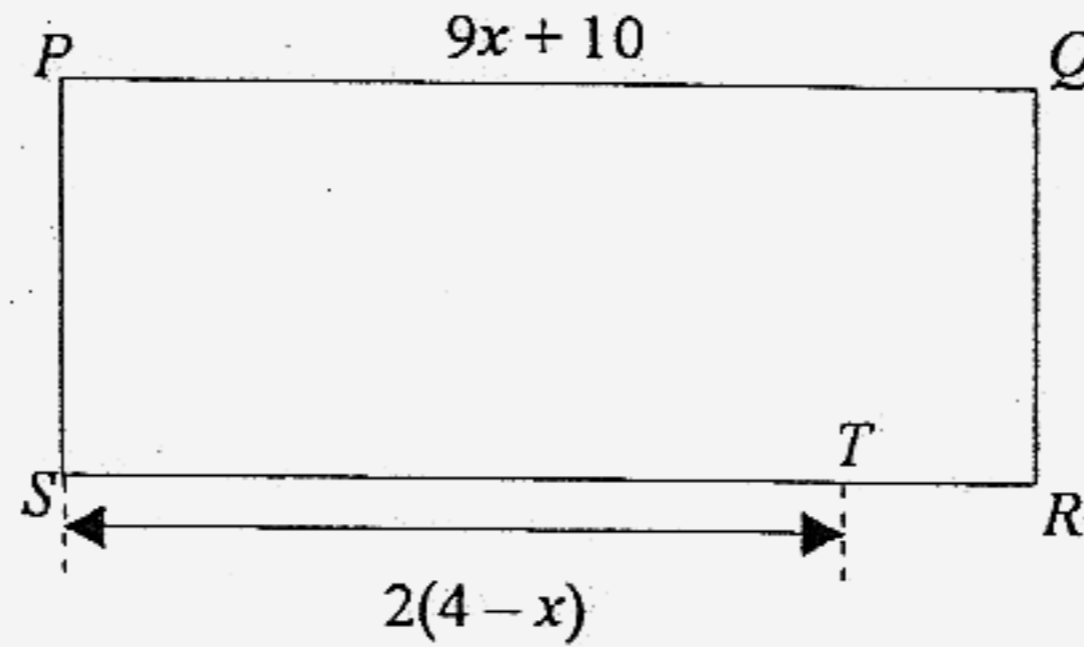
Answer (a) [1]

(b) [2]

End of Section A

Section B [50 marks]
Answer all the questions.

15

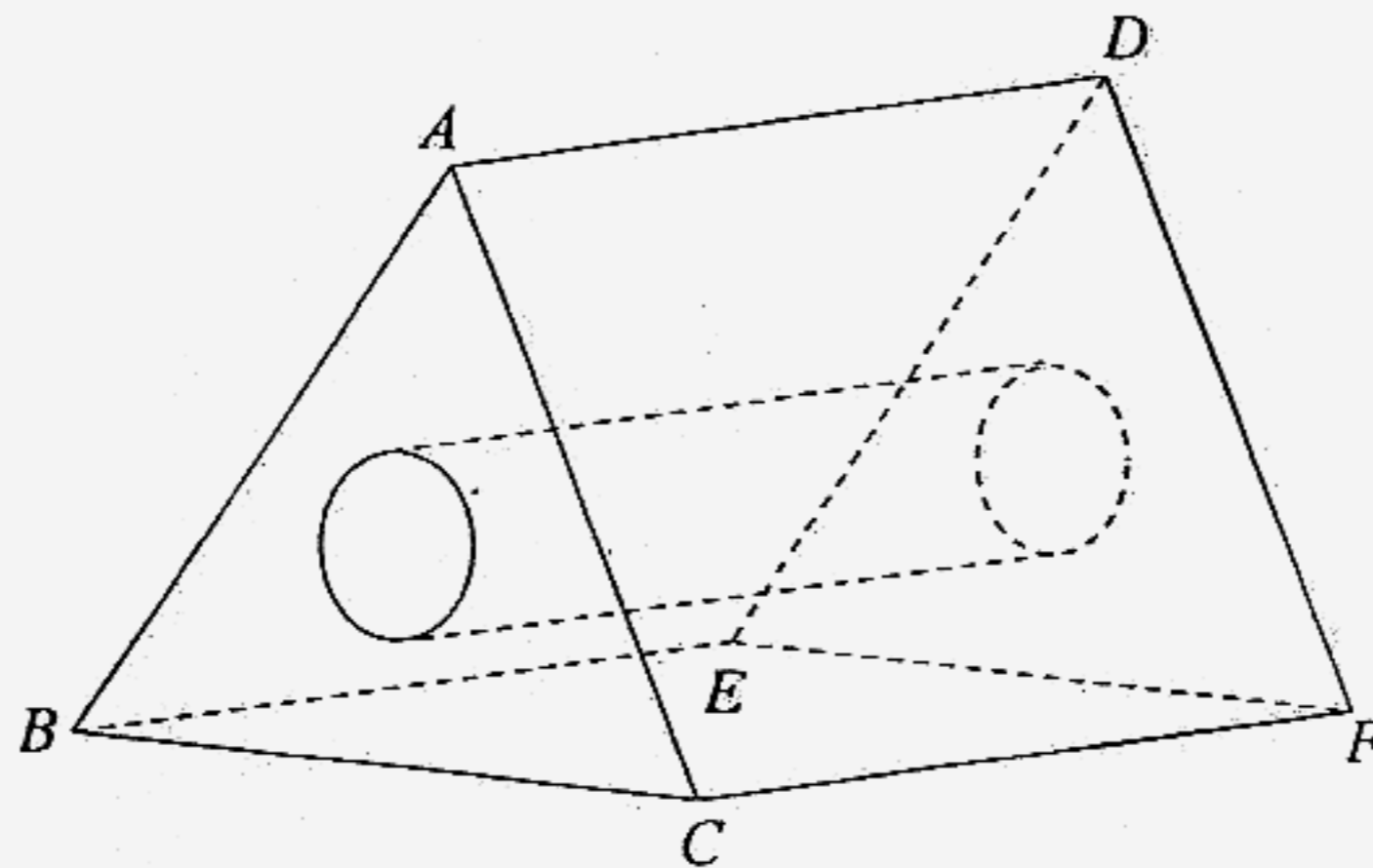


$PQRS$ is a rectangle. T is a point on SR such that ST is $2(4 - x)$ units and PQ is $(9x + 10)$ units. The perimeter of the rectangle is $(48 - 2x)$ units.

Find in terms of x , the length of

- (a) TR , [2]
 (b) PS . [3]

16



The figure above shows a triangular prism where the cross-sections ABC and DEF are equilateral triangles. It has a cylindrical hole in the centre and a square base $BCFE$ of area 36 cm^2 . The volume of the cylindrical hole is 75.36 cm^3 and the perpendicular distance from A to BC is 5.2 cm .

Find the total surface area of the figure. [6]

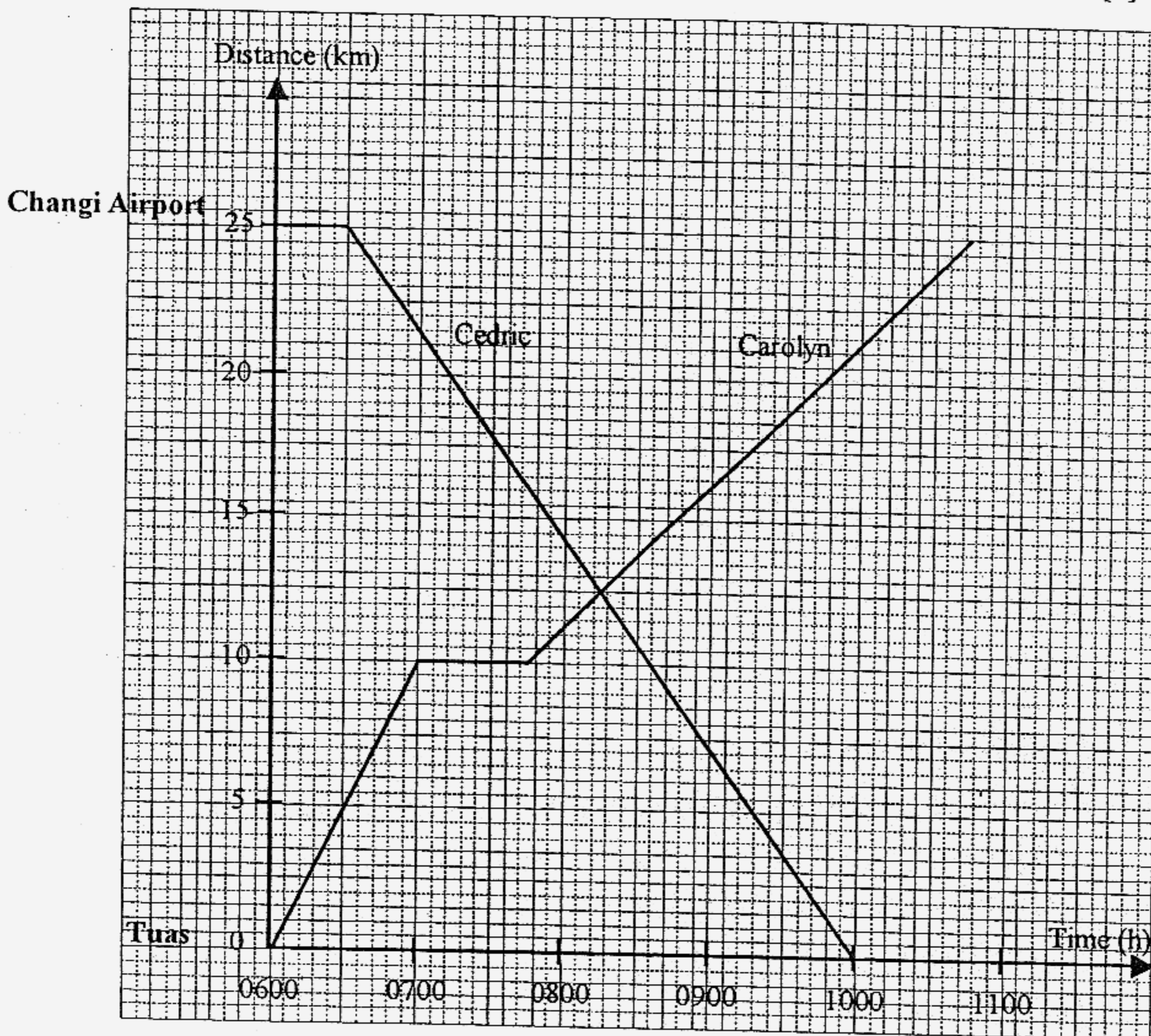
[Take $\pi = 3.14$]

- 17 On a cycling expedition, Carolyn cycled from Tuas to Changi Airport which is 25 km away. At 0600 h, Carolyn started her journey and she travelled at a constant speed of 10 km/h until 0700 h. She then rested for 45 minutes before completing the rest of the journey at a constant speed of 5 km/h.

At 0630 h, another cyclist, Cedric started from Changi Airport and travelled at a constant speed towards Tuas.

The graph below shows the travel graphs of Carolyn and Cedric.

- (a) At what time did Carolyn reach Changi Airport? [1]
 (b) How far was Carolyn from Changi Airport during her rest? [1]
 (c) How far has Carolyn travelled when she met Cedric? [1]
 (d) How far were they from each other at 0930 h? [2]
 (e) At what speed was Cedric travelling at? [2]
 (f) Find the average speed of Carolyn for the whole journey. [3]



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

A survey was conducted on 250 students on their family size. The results are shown in the table below.

Number of family members	2	3	4	5	6
Frequency	16	64	85	55	30

Represent the above data using a histogram. [4]

19 Answer the whole of this question on a sheet of plain paper.

Construct a quadrilateral $ABCD$ in which $AB = 7$ cm, $BC = 5$ cm, $DC = 6$ cm, $\angle BAD = 45^\circ$ and diagonal $BD = 8$ cm. [3]

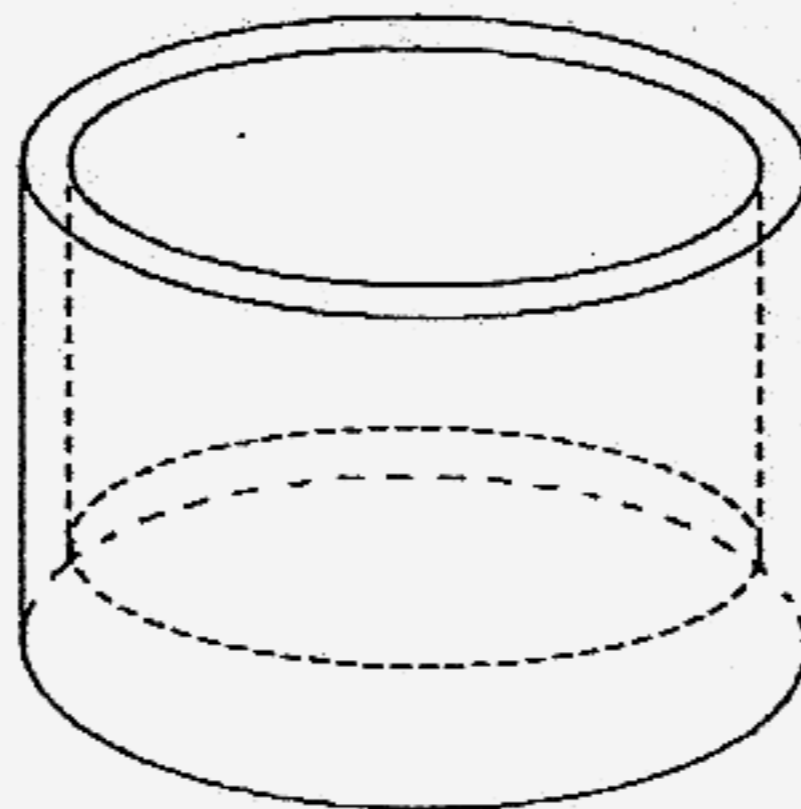
(a) Measure and write down the length of AC . [1]

(b) On the same diagram, construct and label

(i) l_1 , the perpendicular bisector of AB , [1]

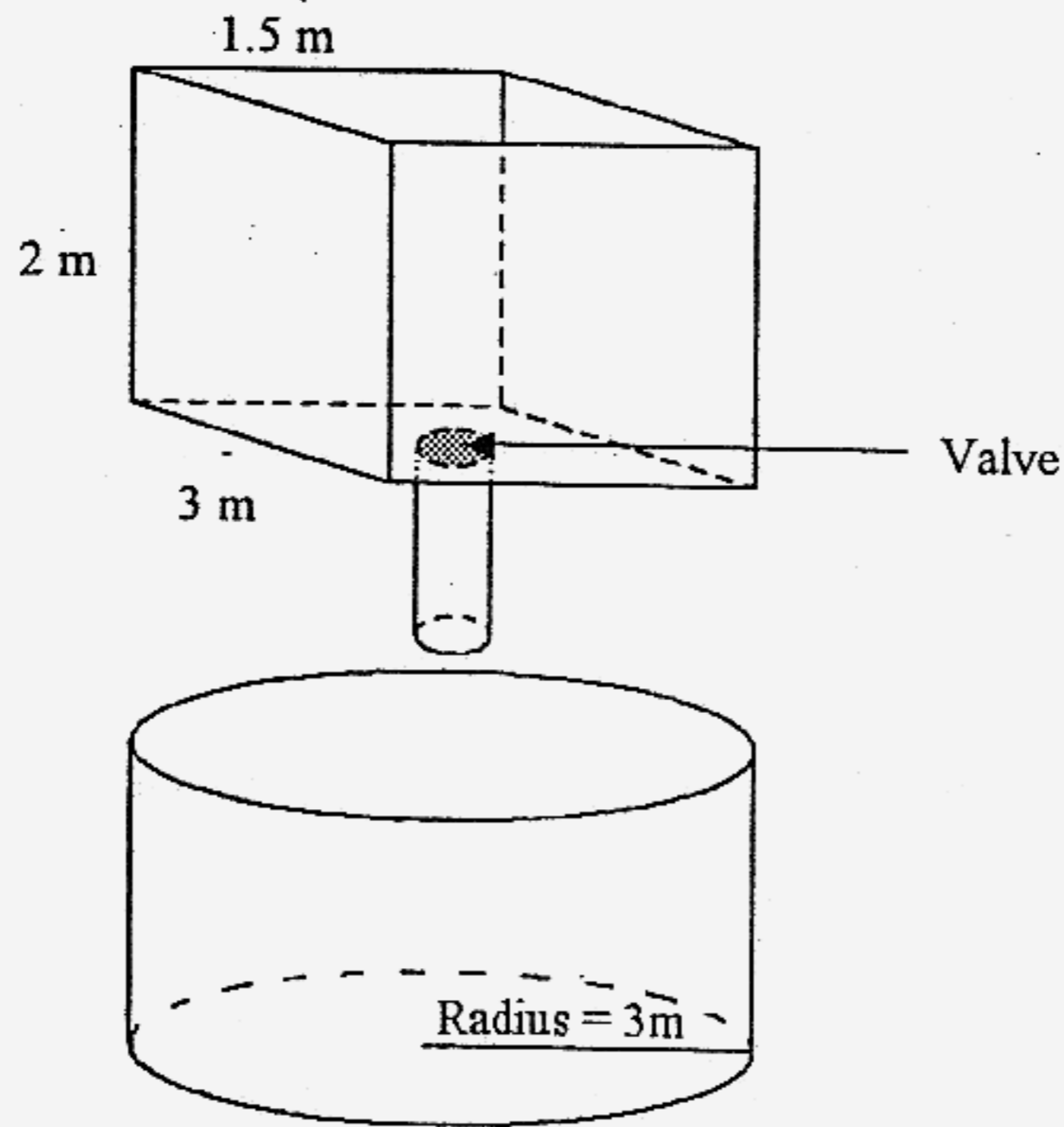
(ii) l_2 , the angle bisector of $\angle ADC$. [1]

20



A hollow tank above has an internal diameter of 7 m and an external diameter of 8 m. The external height of the tank is 9 m and the thickness of the base is 1.5 m. If the density of the material used to make the tank is 50 g/cm^3 , calculate the weight of the tank in kg. [4]

21



The rectangular tank above is initially completely filled with water. The valve is then opened and water starts to flow into the cylindrical tank. If the water level in the rectangular tank is decreasing at a constant rate of 10 cm/s.

Find

- (a) the time taken for the rectangular tank to be completely drained, [1]
- (b) the rate of water flow from the rectangular tank in m^3/s , [2]
- (c) the height of the water level in the cylindrical tank after 10 seconds. [2]

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

Variables x and y are related by the equation $2y + 3x - 4 = 1$. The table below shows some corresponding values of x and y .

x	-3	-2	-1	0	1	2	3
y	a	5.5	b	2.5	c	-0.5	d

- (a) Calculate the values of a , b , c and d . [2]
- (b) Using a scale of 2 cm to represent 1 unit on the x -axis and 1 cm to represent 1 unit on the y -axis, draw the graph of $2y + 3x - 4 = 1$. [3]

Hence, use your graph to find

- (i) the value of y when $x = 1.4$, [1]
- (ii) the value of x when $y = -1$. [1]
- (c) (i) On the same axes, plot the graph of $y = 3x$. [2]
- (ii) Hence, write down the coordinates of the point of intersection of the graphs of $2y + 3x - 4 = 1$ and $y = 3x$. [1]

End of Section B

Cedar Girls' Secondary School
Mathematics Secondary One EYE 2006 (Answer Key)

	Section A		Section B		
1	a)	0.39	15	a)	$TR = 11x + 2$
	b)	$\frac{77}{200}$		b)	$PS = 2(7 - 5x)$
2	a)	-1, 0, 4	16		189.44 cm ²
	b)	$\pi, \sqrt{21}$	17	a)	1045hrs
3	a)	-2		b)	15 km
	b)	$-11\frac{1}{5}$		c)	12.5 km
4	a)	$4\frac{4}{5}, 4.8$		d)	15.25 km
	b)	21:20		e)	7.14 km/h
5	a)	$3^4 \times 7^2$		f)	5.26 km/h
	b)	21	18		Histogram
6	a)	510	19		11.5 cm (± 0.2 cm)
	b)	6.8	20		8 190 000kg.
7	a)	$7a(2a-1)$	21	a)	20 seconds
	b)	$\frac{75y}{2}$ or $37\frac{1}{2}y$		b)	0.45 m ³ /s
8	a)	$\frac{20}{3x}$		c)	0.159 m
	b)	$\frac{-14x+13}{12}$	22	a)	a = 7 b = 4 c = 1 d = -2
9	a)	$7\frac{1}{3}$		b)i)	0.4
	b)	$-\frac{2}{3}$		b)ii)	2.35
10	a)	6 pupils		c)ii)	(0.58, 1.7)
	b)	50%			
11	a)	$n = 12$			
	b)	1800°			
12	a)	$\angle EAD = x^\circ$			
	b)	$\angle ACD = \frac{180^\circ - x^\circ}{2}$			
	c)	$16\frac{1}{2}, 16.5\text{cm}^2$			
13		1.20 pm or 1320			
14	a)	128 shaded triangles			
	b)	$2 \times 4^{n-1}, 2^{2n-1}$ shaded triangles			