

Answer ALL NINETEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. Here is a list of ingredients to make melon sorbet for 6 people.

Melon Sorbet for 6 people	
800 g	melon
4	egg whites
$\frac{1}{2}$	lime
100 g	caster sugar

$\times 3$

Terry makes melon sorbet for 18 people.

- (a) Work out how much caster sugar he uses.

$$100\text{g} \times 3$$

$$\begin{array}{r} 300 \\ \hline \end{array} \text{g} \quad (2)$$

Hedley makes melon sorbet.
He uses 2 limes.

- (b) Work out how many people he makes melon sorbet for.

$$\begin{array}{l} \frac{1}{2} \text{ lime} = 6 \text{ people} \\ \left(\begin{array}{l} \frac{1}{2} \text{ lime} = 6 \text{ people} \\ 2 \text{ limes} = 24 \text{ people} \end{array} \right) \times 4 \end{array}$$

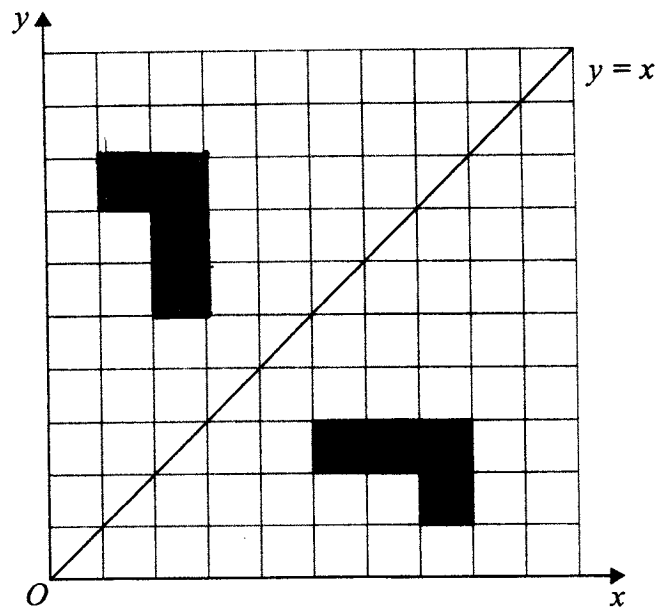
$$\begin{array}{r} 24 \\ \hline \end{array} \quad (2)$$

(Total 4 marks)

Q1

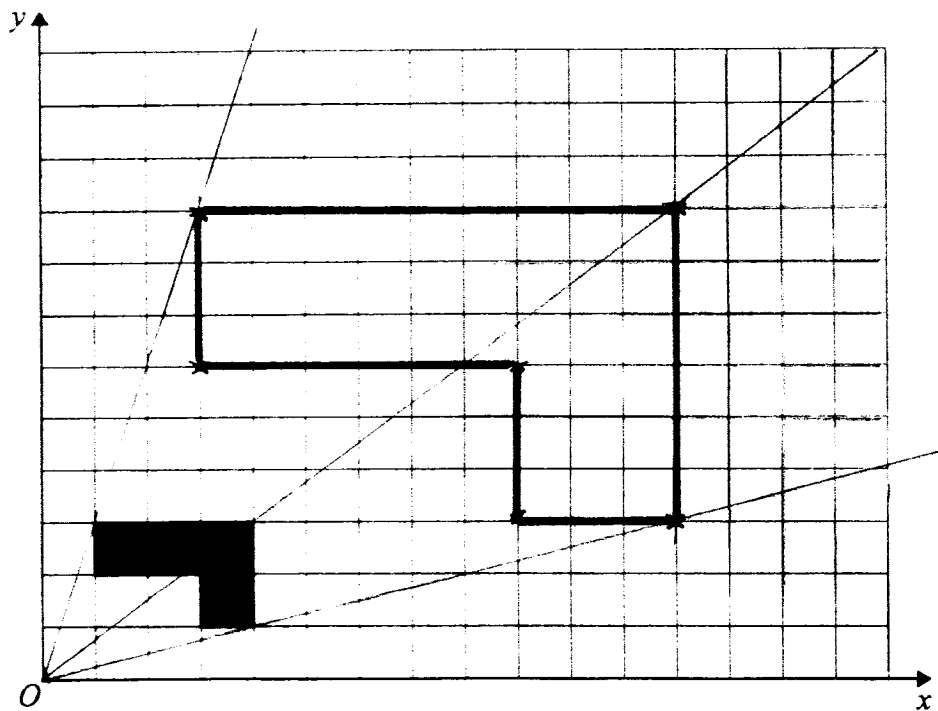


2.



(a) Reflect the shaded shape in the line $y = x$.

(2)



(b) On the grid, enlarge the shaded shape by a scale factor of 3, centre O .

(3)

Q2

(Total 5 marks)



3. Noah got 8 out of 20 in a test.

Write 8 out of 20 as a percentage.

$$\frac{8}{20} \times 100$$

40 %

Q3

(Total 2 marks)

4. (a) Solve $2x + 3 = 10$

$$2x = 10 - 3$$

$$2x = 7$$

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

Change side
change sign

$$x = 3.5$$

(2)

- (b) Simplify

(i) $c^5 \times c^6$

$$c^{11}$$

(ii) $e^{12} \div e^4$

$$e^8$$

(2)

Q4

(Total 4 marks)



5. Use your calculator to work out

$$\frac{13.7 + 5.86}{2.54 \times 3.17}$$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

2.429270474 Q5

(Total 2 marks)

6. $-3 < k \leq 2$ \leftarrow 2 is included
k is an integer.

Write down all the possible values of k .

-3 is NOT included

-2, -1, 0, 1, 2 Q6

(Total 2 marks)



7. A shop sells small boxes and large boxes for storing CDs.

A small box stores x CDs.

A large box stores y CDs.

Ethan buys 7 small boxes.

- (a) Write down an expression for the number of CDs he can store in the 7 small boxes.

$$\underline{7x} \quad (1)$$

Ethan also buys 5 large boxes.

- (b) Write down an expression for the number of CDs he can store in the 5 large boxes.

$$\underline{5y} \quad (1)$$

Ethan can store a total of T CDs.

- (c) Write down a formula for T in terms of x and y .

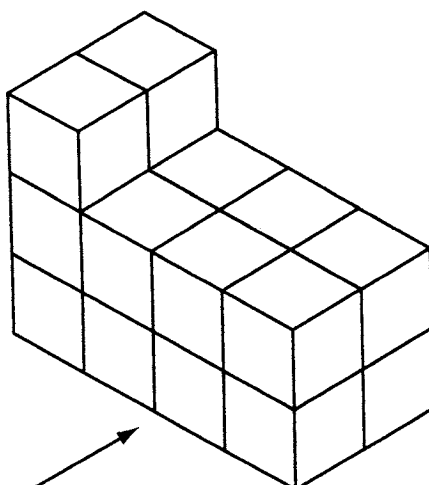
$$\underline{T = 7x + 5y} \quad (1)$$

(Total 3 marks)

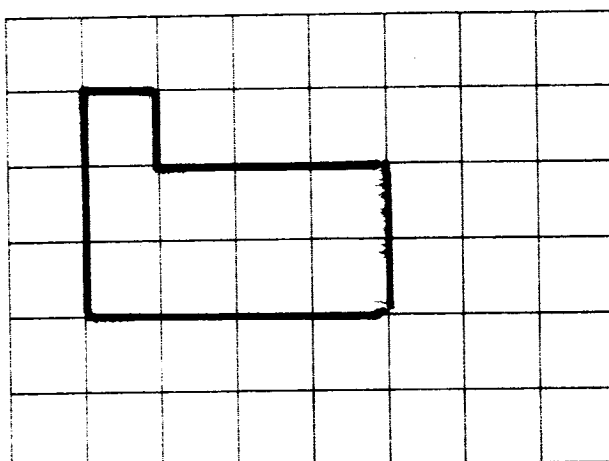
Q7



8. The diagram shows a solid prism made from centimetre cubes.

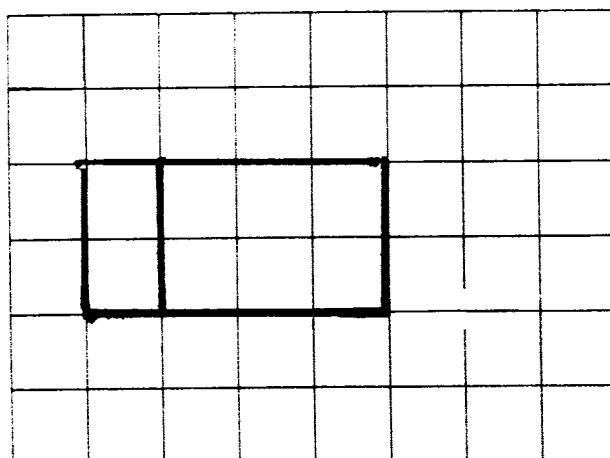


- (a) On the centimetre square grid, draw the front elevation of the solid prism from the direction shown by the arrow.



(2)

- (b) On the centimetre square grid below, draw the plan of the solid prism.



(2)

Q8

(Total 4 marks)



Change Side \Rightarrow Change Sign

Leave blank

9. (a) Solve $3(k-5) = 24$

OR

$$k-5 = \frac{24}{3}$$

$$3k - 15 = 24$$

$$k-5 = 8$$

$$3k = 24 + 15$$

$$k = 8 + 5$$

$$3k = 39$$

$$k = 13$$

$$k = \frac{39}{3}$$

(2)

$$2x^2 = 162$$

(b) Find a value of x .

$$x^2 = \frac{162}{2}$$

$$x^2 = 81$$

$$x = \sqrt{81}$$

9

(2)

Q9

(Total 4 marks)

10. Work out $(5.2 \times 10^{-7}) \times (2.8 \times 10^{-9})$

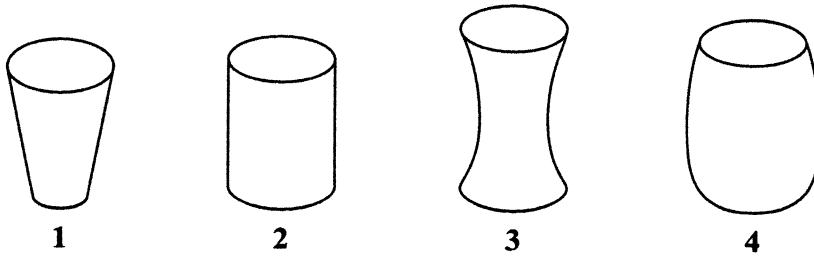
Give your answer in standard form.

$$1.456 \times 10^{-15}$$

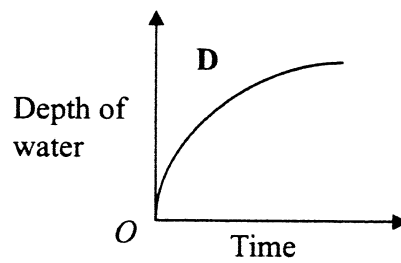
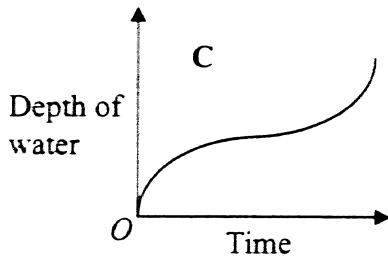
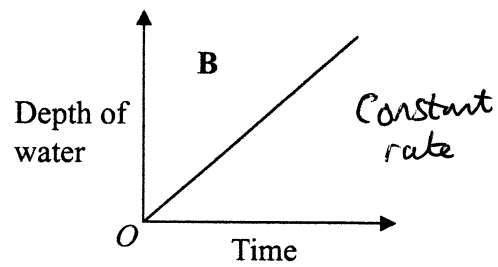
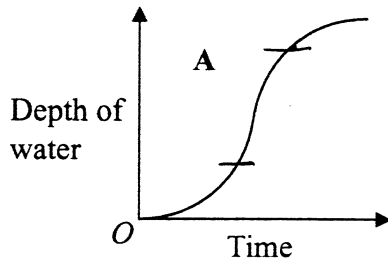
Q10

(Total 2 marks)

11. Here are four containers.
Water is poured into each container at a constant rate.



Here are four graphs.
The graphs show how the depth of the water in each container changes with time.



Match each graph with the correct container.

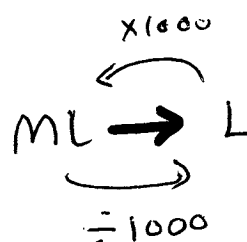
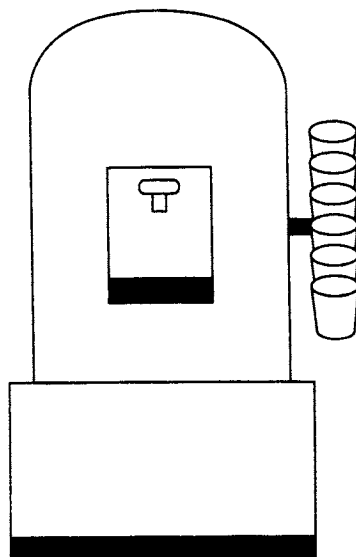
A and 3
B and 2
C and 4
D and 1

Q11

(Total 2 marks)



12.



A water container has 19.5 litres of water in it.
A cup holds 210 ml of water.

At most 92 cups can be filled completely from the water container.
Explain why.
You must show all your working.

$$1000 \text{ ml} = 1 \text{ litre}$$

$$\begin{array}{lcl} \text{Container} & \Rightarrow & 19.5 \text{ L} \\ \text{cup} & \Rightarrow & 0.21 \text{ L} \end{array}$$

$$\frac{19.5}{0.21} = 92.857 \dots$$

∴ Most completely filled cups is 92

Q12

(Total 3 marks)



13. (a) Complete the table of values for $y = x^3 - 7$

x	-2	-1	0	1	2	3
y	-15	-8	-7	-6	1	20

(2)

(b) On the grid, draw the graph of $y = x^3 - 7$ for values of x from -2 to 3



(2)

Q13

(Total 4 marks)



14.

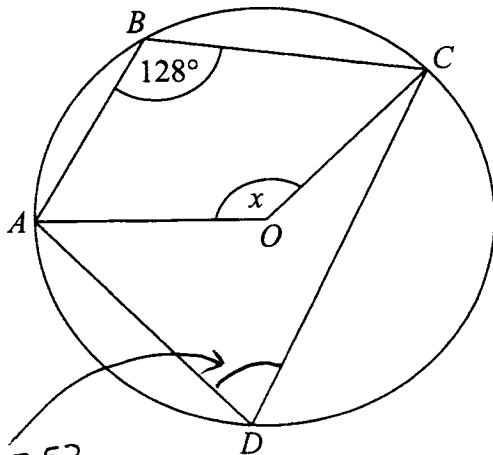


Diagram NOT accurately drawn

$$180 - 128 = 52$$

The diagram shows a circle, centre O .
 A , B , C and D are points on the circumference of the circle.

Angle $ABC = 128^\circ$.

Work out the size of the angle marked x .

x is double 52

104°

(Total 2 marks)

Q14

15.

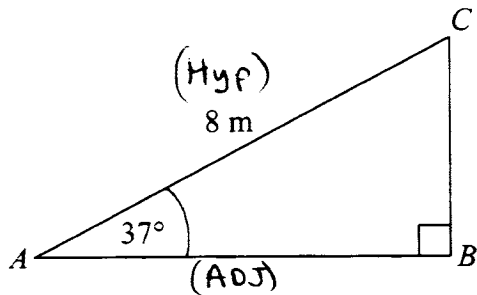


Diagram NOT accurately drawn

ABC is a right-angled triangle.

$AC = 8$ m.

Angle $CAB = 37^\circ$.

Calculate the length of AB .

Give your answer correct to 3 significant figures.

$$Adj = \cos x \times hyp$$

$$AB = \cos 37 \times 8$$

$$AB = 6.3908403$$

A
C H

6.39 m

(Total 3 marks)

Q15



16.

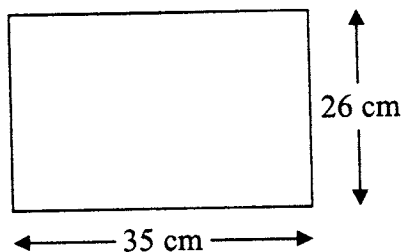


Diagram NOT
accurately drawn

The length of the rectangle is 35 cm correct to the nearest cm.
The width of the rectangle is 26 cm correct to the nearest cm.

Calculate the upper bound for the area of the rectangle.
Write down all the figures on your calculator display.

Length LB 34.5
 UB 35.5

Width LB 25.5
 UB 26.5

Upper bound for area \Rightarrow UB \times UB
 $35.5 \times 26.5 = 940.75$

940.75 cm²

(Total 3 marks)

Q16



17. Solve $\frac{x}{2} + \frac{x}{3} = 8$



OR

$$\frac{1}{2}x + \frac{1}{3}x = 8$$

$$\frac{3x+2x}{6} = 8$$

$$\frac{5}{6}x = 8$$

$$x = \frac{8}{5/6}$$

$$x = 9.6$$

$$\frac{5x}{6} = 8$$

$$5x = 48$$

$$x = \frac{48}{5}$$

$$x = 9.6$$

$$x = 9.6$$

Q17

(Total 2 marks)

18. Make n the subject of the formula

$$a = \frac{6a-n}{3+n}$$

Eliminate fraction

$$a(3+n) = 6a-n$$

$$3a + an = 6a - n$$

Get all n terms on one side

$$n + an = 6a - 3a$$

$$n + an = 3a$$

Factorise

$$n(1+a) = 3a$$

$$n = \frac{3a}{1+a}$$

$$n = \frac{3a}{1+a} \text{ or } \frac{3a}{a+1}$$

Q18

(Total 4 marks)

19.

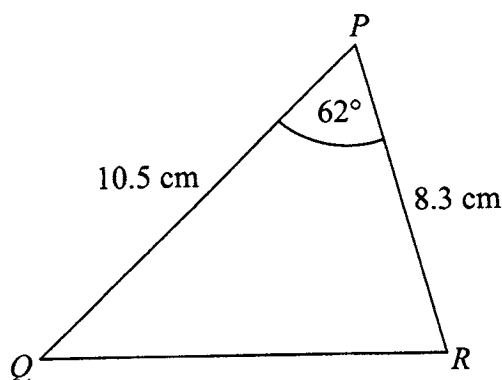


Diagram NOT accurately drawn

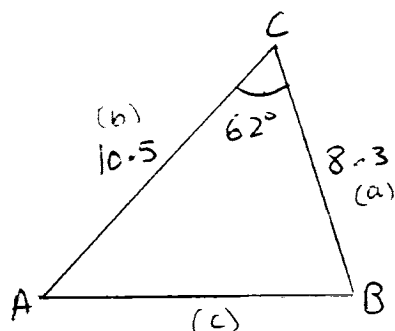
In triangle PQR ,

$PQ = 10.5$ cm,

$PR = 8.3$ cm,

angle $QPR = 62^\circ$.

- (a) Calculate the area of triangle PQR .
Give your answer correct to 3 significant figures.

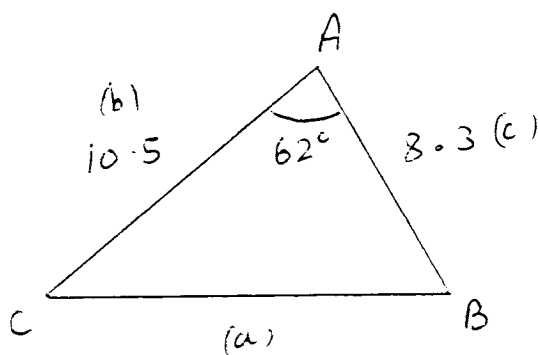


$$\frac{1}{2} ab \sin C$$

$$\frac{1}{2} (8.3)(10.5) \sin 62$$

$$= 38.47444 \dots \quad 38.5 \dots \text{cm}^2 \quad (2)$$

- (b) Calculate the length of QR .
Give your answer correct to 3 significant figures.



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 10.5^2 + 8.3^2 - 2(10.5)(8.3) \times \cos 62$$

$$a^2 = 97.31110661$$

$$a = \sqrt{97.31110661}$$

$$a = 9.864639 \dots$$

$$9.86 \dots \text{cm} \quad (3)$$

(Total 5 marks)

TOTAL FOR PAPER: 60 MARKS

END

