

66.

Chris and Molly win money in a competition.
They share the money in the ratio 2 : 3
Molly receives £240.

(a) How much money does Chris receive?

$$240 \div 3 = 80$$

$$80 \times 2 = 160$$

$$\begin{array}{r} \text{£ } 160 \\ \hline \end{array} \quad (2)$$

(b) How much money did they win in the competition?

$$\begin{array}{r} \text{£ } 400 \\ \hline \end{array} \quad (1)$$

67.

Work out

$$10^{-2}$$

Give your answer as a decimal.

$$\frac{1}{10^2} = \frac{1}{100}$$

$$\begin{array}{r} 0.01 \\ \hline \end{array} \quad (2)$$

68

Solve $4y + 1 = 6y + 26$

$$-4y \quad 1 = 2y + 26 \quad -4y$$

$$-26 \quad -25 = 2y \quad -26$$

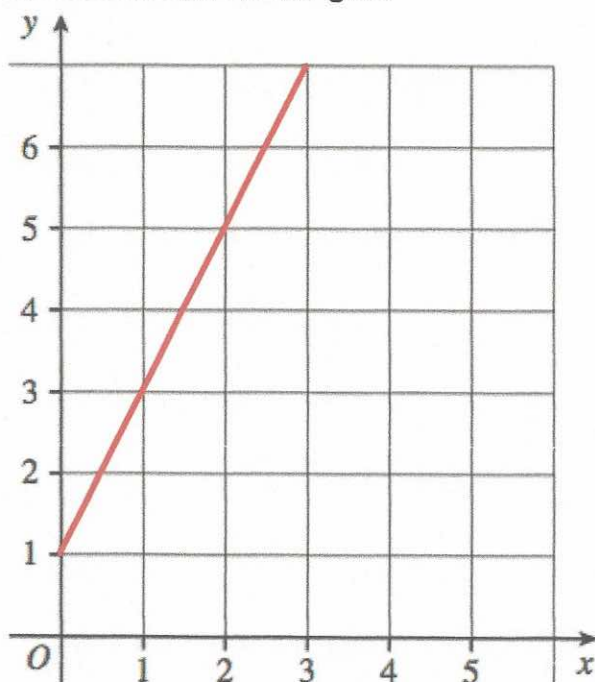
$$\div 2 \quad -12.5 = y \quad \div 2$$

$$y = -12.5$$

(2)

69

A straight line L is shown on the grid.



Work out the equation of line L

$$y = 2x + 1$$

(3)

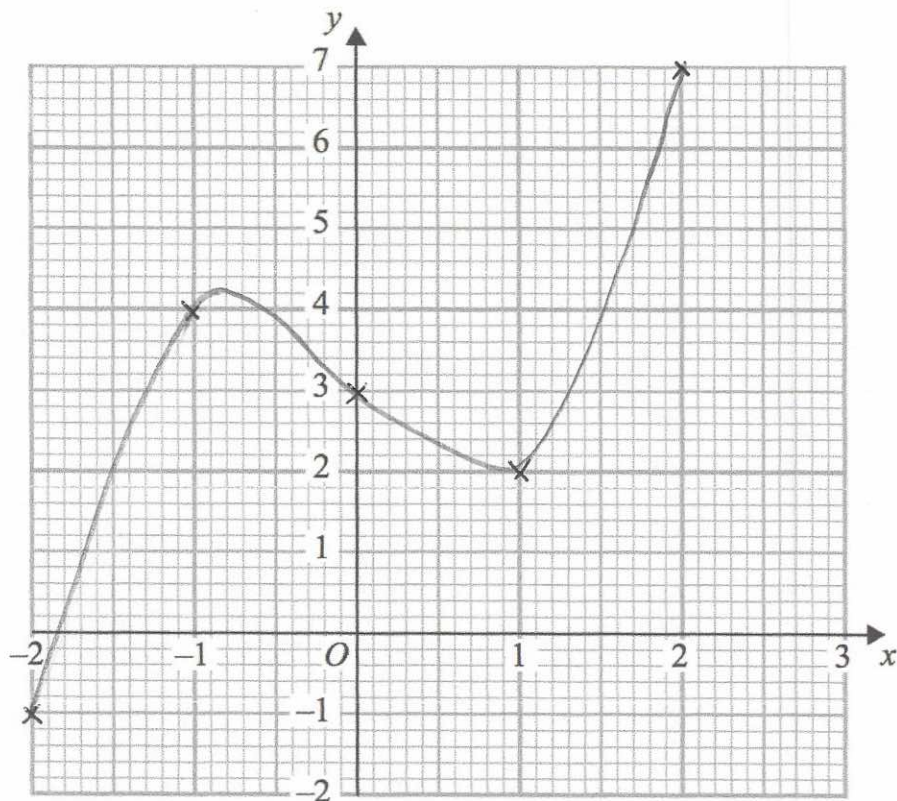
70.

(a) Complete the table of values for $y = x^3 - 2x + 3$

x	-2	-1	0	1	2
y	-1	4	3	2	7

(2)

(b) On the grid, draw the graph of $y = x^3 - 2x + 3$ for the values of x $-2 \leq x \leq 2$



(2)

71

Iron has a density of 7.8g/cm^3 .

A solid iron statue has a mass of 877.5g .

Work out the volume of the statue.

$$V = \frac{m}{D} = \frac{877.5}{7.8}$$

112.5..... cm^3
(2)

A box is placed on the floor.

The area of the box in contact with the floor is 2.4m^2

Pressure exerted on the floor 16 newtons/m^2

Work out the force exerted by the box on the floor.

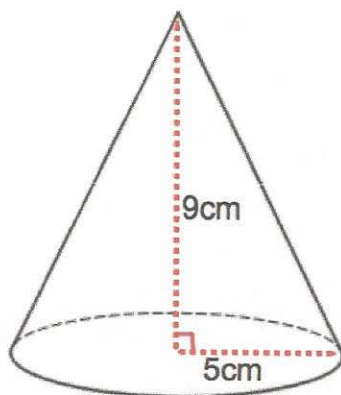
$$\begin{aligned} F &= P \times A \\ &= 16 \times 2.4 \end{aligned}$$

$$\begin{array}{r} 38.4 \end{array} \text{ N}$$

(3)

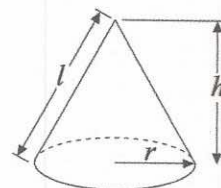
73

A cone has base radius 5cm and perpendicular height 9cm.



$$\text{Volume of cone} = \frac{1}{3}\pi r^2 h$$

$$\text{Curved surface area of cone} = \pi r l$$



Work out the volume of the cone.

$$\frac{1}{3} \times \pi \times 5^2 \times 9$$

$$\underline{235.62} \text{ cm}^3$$

(3)

24

Given

$$a = \begin{pmatrix} 6 \\ -4 \end{pmatrix} \quad b = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$$

Work out $3a - b$

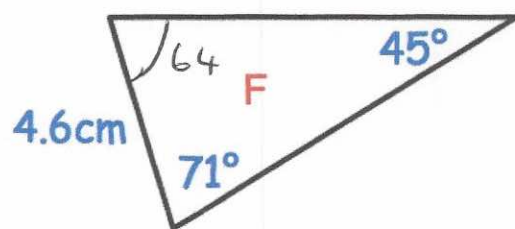
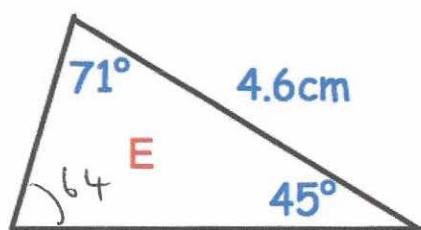
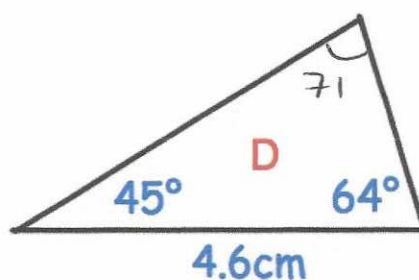
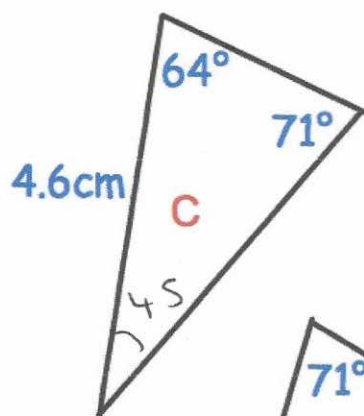
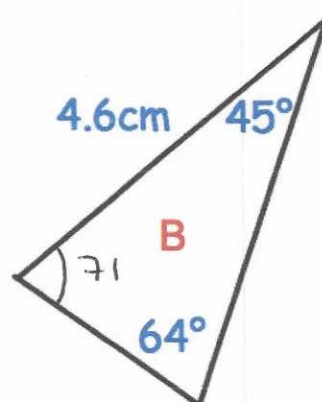
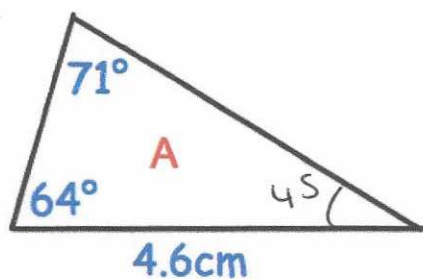
$$3 \underline{a} = \begin{pmatrix} 18 \\ -12 \end{pmatrix}$$

$$3 \underline{a} - \underline{b} = \begin{pmatrix} 20 \\ -13 \end{pmatrix}$$

$$\begin{array}{r} \begin{pmatrix} 20 \\ -13 \end{pmatrix} \\ \hline (3) \end{array}$$

75

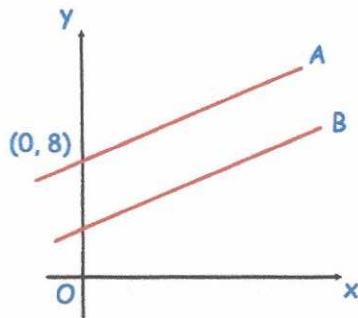
Shown below are six triangles that are not drawn accurately.



Which two triangles are congruent to triangle A?

.....D..... andC.....
(2)

76



The lines A and B are parallel.

The line A passes through the point (0, 8)

The line B has equation $y = 3x + 4$

Write down the equation of line A

$$y = 3x + 8$$

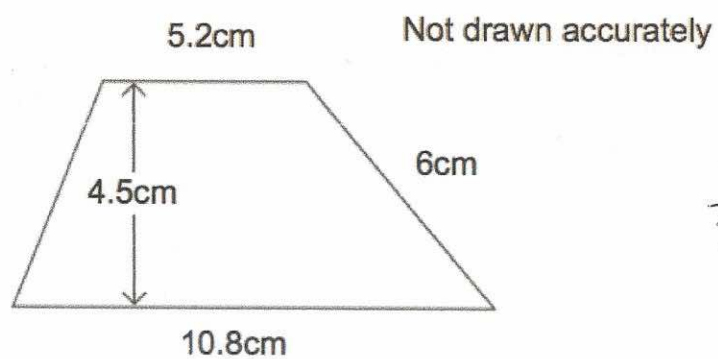
(2)

77

Write down the exact value of $\sin 30^\circ$

0.5 or $\frac{1}{2}$
(1)

48



$$\frac{1}{2} (5.2 + 10.8) \times 4.5$$

Calculate the area of the trapezium.

$$\underline{\quad 36 \quad} \text{cm}^2$$

(2)

79 134

Write these numbers in order of size.
Start with the smallest number.

✓ 0.92 ✓ 0.901 ✓ 0.99 ✓ 0.099 ✓ 0.909

0.099, 0.901, 0.909, 0.92, 0.99
(1)



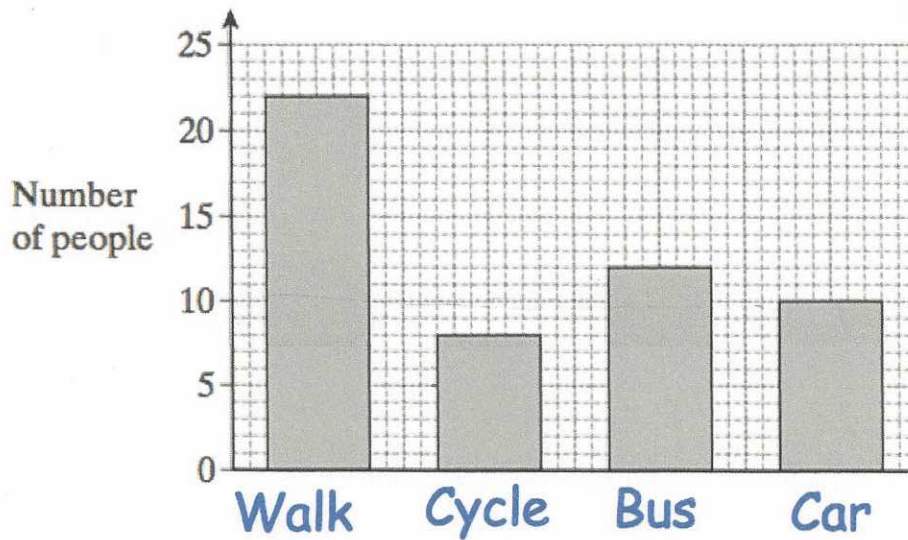
Complete the table.

Fraction	Decimal	Percentage
$\frac{17}{20}$	0.85	85%
$\frac{3}{25}$	0.12	12%.
$\frac{23}{25}$	0.92	92%.

(4)

81.

A manager surveys his employees to find out how they travel to work.



(a) What is the least popular method of transport?

Cycle
(1)

(b) What is the most popular method of transport?

Walk
(1)

(c) Calculate the total number of employees.

$$22 + 8 + 12 + 10$$

52
(2)


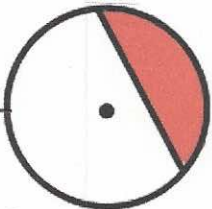
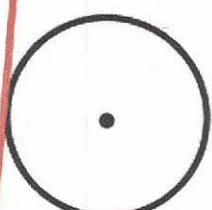

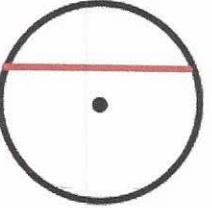
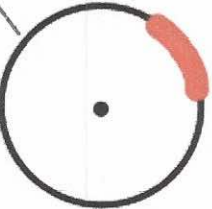
82

Here are 6 diagrams and 6 labels.

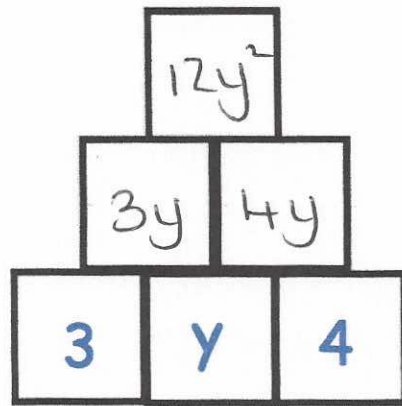
In the diagram the centre of the circle is shown with a dot.

Match each diagram to its label.

One has been done for you.

Label	Diagram
Circle and radius	
Circle and segment	
Circle and arc	
Circle and diameter	
Circle and tangent	
Circle and chord	

88



To find the contents of each empty box, multiply the two terms directly beneath it.

Complete the multiplication pyramid.

(3)

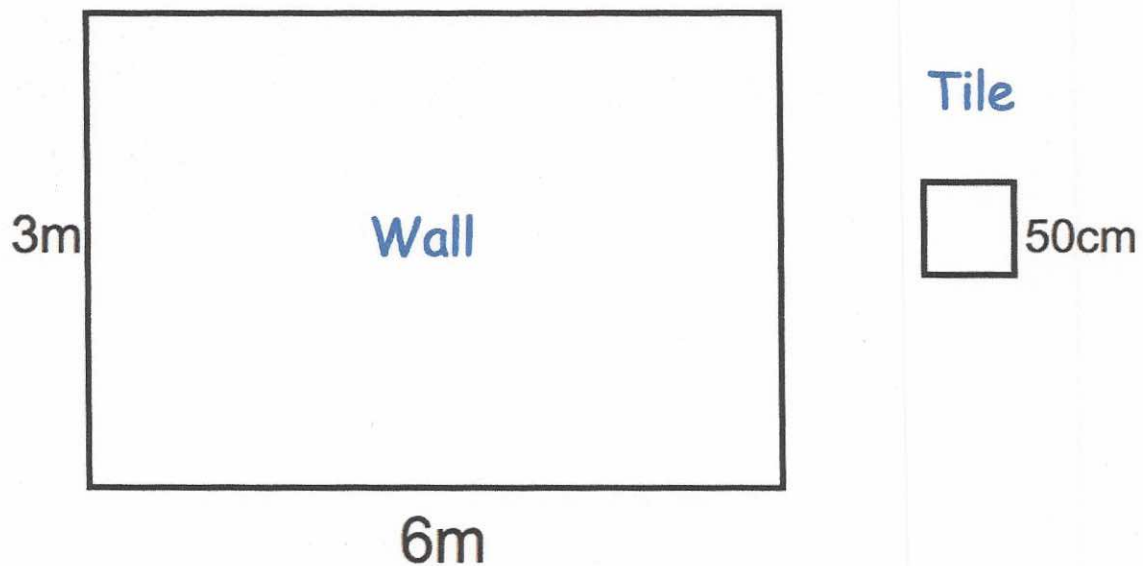
94

Simplify $9h + 5k + 4h - 8k$

$$\begin{aligned} &9h + 4h + 5k - 8k \\ &= 13h - 3k \end{aligned}$$

.....
(2)

Not to scale



Mollie is tiling her bathroom wall.
 The wall is 6m by 3m.
 Each square tile is 50cm by 50cm.
 Each tile cost £4.

Calculate the cost of tiling the wall.

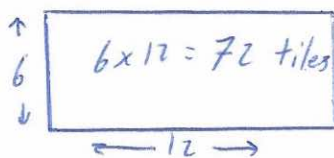
$$\text{Area of wall} = 3 \times 6 = 18\text{m}^2$$

$$\text{Area of 1 tile} = 0.5 \times 0.5 = 0.25\text{m}^2$$

$$18 \div 0.25 = 72 \text{ tiles}$$

$$72 \times 4 =$$

or



$$72 \times 4 = 288$$

£ 288

(4)

86

- (a) Write down two multiples of 7.

.....14..... and28.....
(1)

- (b) Write down two multiples of 9.

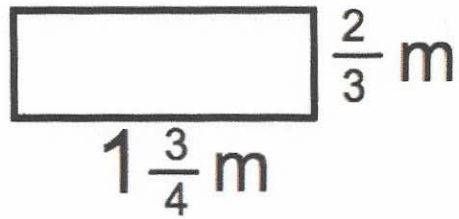
.....18..... and36.....
(1)

- (c) Write down a number which is a multiple of both 7 and 9.

7 \Rightarrow 7, 14, 21, 28, 35, 42, 49,
56, 63, 70
9 \Rightarrow 9, 18, 27, 36, 45, 54, 63, 72, 81, 90
63
.....
(1)

87

Jessica wants to attach ribbon around her wardrobe.



She has 4 metres of ribbon.

How much more does she need?

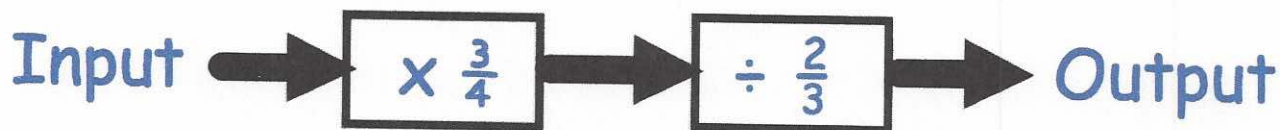
Give your answer as a fraction.

$$1\frac{3}{4} + \frac{2}{3} + 1\frac{3}{4} + \frac{2}{3} = \frac{29}{6}$$

$$\text{Ans } \frac{29}{6} - 4 = \frac{5}{6}$$

$$\frac{5}{6} \text{ m}$$

(4)



(a) Find the output, if the input is 2.

$$2 \times \frac{3}{4} = 1.5$$

$$1.5 \div \frac{2}{3} = 2.25$$

$$\text{or } \frac{3}{2} \div \frac{2}{3}$$

$$\frac{3}{2} \times \frac{3}{2} = \frac{9}{4}$$

$$= 2\frac{1}{4}$$

$$\begin{array}{r} 2.25 \\ \hline (3) \end{array}$$

(b) Find the input, if the output is $\frac{1}{2}$

$$\frac{1}{2} \times \frac{2}{3} = \frac{1}{3}$$

$$\frac{1}{3} \div \frac{3}{4} = \frac{4}{9}$$

$$\begin{array}{r} 4 \\ 9 \overline{) 4} \\ \hline (3) \end{array}$$

80

$$y = w - 2a^2$$

$$w = 400$$

$$a = 5$$

Work out the value of y .

$$400 - 2(5^2)$$

$$= 400 - 50$$

$$= 350$$

$$\begin{array}{r} 350 \\ \hline (2) \end{array}$$

90

A rugby team can win, draw or lose a match.
The table shows the probabilities of each result.

Result	Win	Draw	Lose
Probability	0.4	0.35	0.25

(a) Calculate the missing probability in the table.

$$1 - 0.4 - 0.35$$

$$\begin{array}{r} 0.25 \\ \hline (2) \end{array}$$

Each win is worth 2 points.

Each draw is worth 1 point.

Each loss is worth 0 points.

The rugby team plays 20 games in a season.

(b) Work out how many points the rugby team should receive in one season.

$$20 \times 0.4 = 8$$

$$20 \times 0.35 = 7$$

$$8 \times 2 = 16$$

$$7 \times 1 = 7$$

$$16 + 7 =$$

$$\begin{array}{r} 23 \\ \hline (3) \end{array}$$

91

The distance from Leek to Milton is 310 miles.

A train travels this distance in 4 hours 15 minutes.

Calculate the average speed of the train.

$$S = \frac{d}{t} = \frac{310}{4.25} = 72.941176...$$

$$t = 4 \text{ hr } 15 \text{ min}$$

$$= 4.25 \text{ hr}$$

$$\underline{72.9} \text{ mph}$$

(3)

92

Two numbers are in the ratio 3:7

One of the numbers is 42

There are two possible values for the other number.

What are the two possible values?

$$7 \times 6 = 42$$

$$3 \times 6 = 18$$

$$3 \times 14 = 42$$

$$7 \times 14 = 98$$

2 possible values are 18 + 98

03

Sarah bought a TV for £250
Three years later she sold it for £180

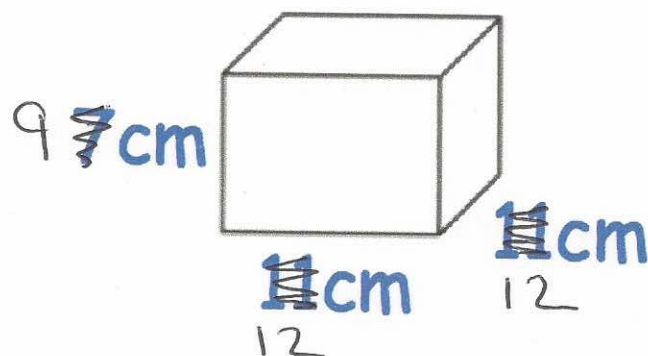
Work out her percentage loss

$$250 - 180 = 70$$

$$\frac{70}{250} \times 100 = 28\%$$

.....28.....%
(3)

94



Work out the surface area of this cuboid.
State the units of your answer.

$$9 \times 12 = 108$$

$$12 \times 12 = 144$$

$$108 \times 4 = 432$$

$$144 \times 2 = 288$$

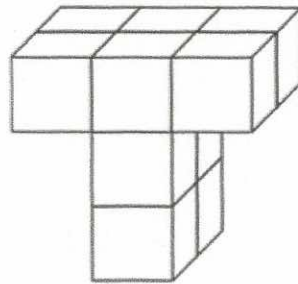
$$432 + 288 =$$

$$\underline{720 \text{ cm}^2}$$

(3)

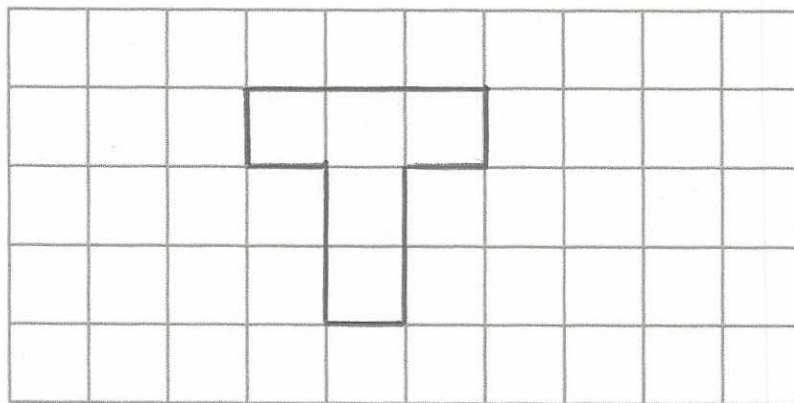
15

Shown below is a solid shape made from centimetre cubes.



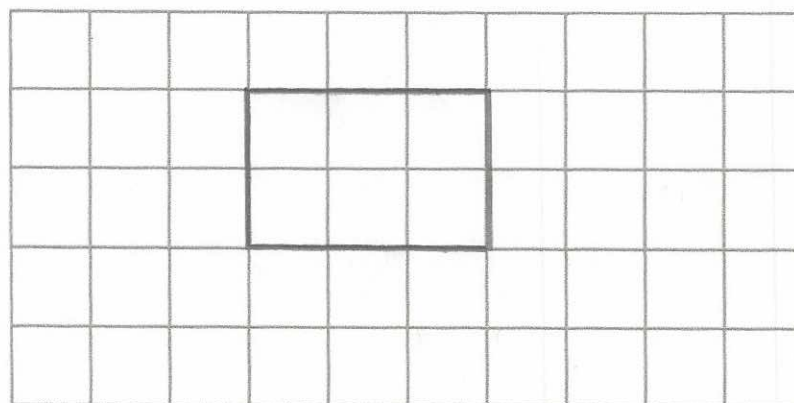

Front

(a) On the centimetre square grid, draw the front elevation.

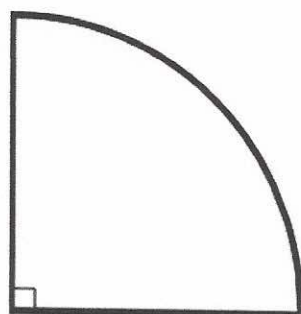


(2)

(b) On the centimetre square grid, draw the plan view.



(2)



8cm

Calculate the perimeter of the sector.

$$\text{Arc length} = \frac{1}{4} \times 2 \times \pi \times 8 = 12.5664\dots$$

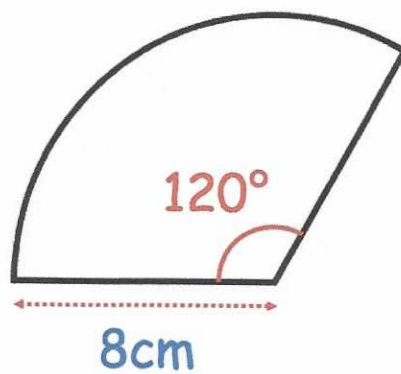
$$P = 12.5664\dots + 8 + 8$$

$$= 28.5664\dots$$

$$\underline{\underline{28.6 \text{ cm}}}$$

(2)

97



Calculate the area of the sector.

$$\text{Area} = \frac{120}{360} \times \pi \times 8^2$$

$$= 67.02064 \dots$$

$$\underline{\underline{67.02 \text{ cm}^2}} \\ (2)$$

28

A number, n , is rounded to 1 decimal place.

The result is 1.3

Using inequalities, write down the error interval for n .

$$1.25 \leq n < 1.35$$

A supermarket sells Baked Beans in two different size cans.



215g

40p



395g

74p

Which size can is the best value for money?
You must show all your working.

$$\frac{215g}{215} = \frac{40p}{215}$$

$$1g = \frac{40}{215}p$$

$$1kg = 186p = £1.86$$

(4)

$$\frac{395g}{395} = \frac{74p}{395}$$

$$1g = \frac{74}{395}p$$

$$1kg = 187p = £1.87$$

The 215g can is better value.

Work out

$$\sqrt[4]{100 - 2.4^3}$$

Write down all the figures from your calculator display.

3.046818493

(2)

The sizes of the interior angles of a triangle are in the ratio 1:3:8
Calculate the difference in size between the largest and smallest angles.

Angles in triangle add to 180°

$$1 + 3 + 8 = 12$$

$$180 \div 12 = 15$$

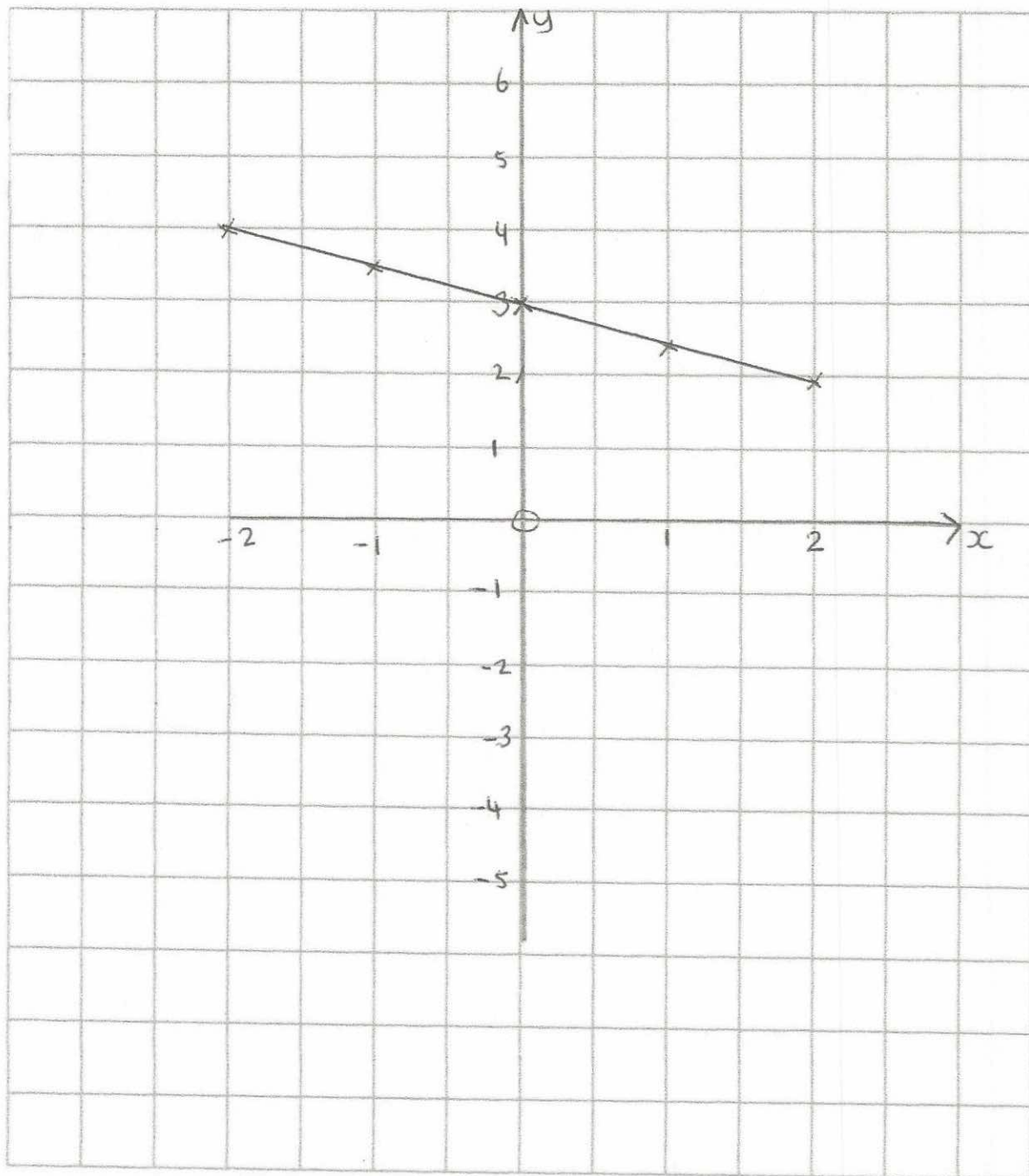
$$\text{smallest angle} = 1 \times 15 = 15^\circ$$

$$\text{largest angle} = 8 \times 15 = 120^\circ$$

$$120 - 15 = \underline{105^\circ}$$

102. On the grid, draw $x + 2y = 6$ for values of x from -2 to 2 .

x	0	1	2	-1	-2
y	3	2.5	2	3.5	4



(4)