

Year 9

Mathematics

Higher: No calculator allowed

Time allowed: 45 minutes

First name						
Middle name						
Last name						
Date of birth	Day		Month		Year	
Teacher						

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1

Which is greater, $2\frac{1}{2}\%$ of £450 or 250% of £1.20?

Show working to justify your answer.

2 marks

2

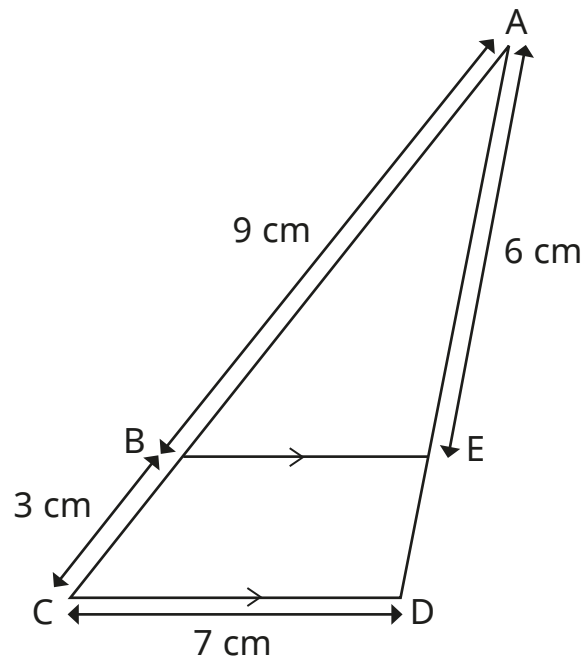
The highest common factor of 45 and 75 is the square root of x .

Work out the value of x .

$x =$

2 marks

3



BE is parallel to CD.

AB = 9 cm, BC = 3 cm, CD = 7 cm and AE = 6 cm

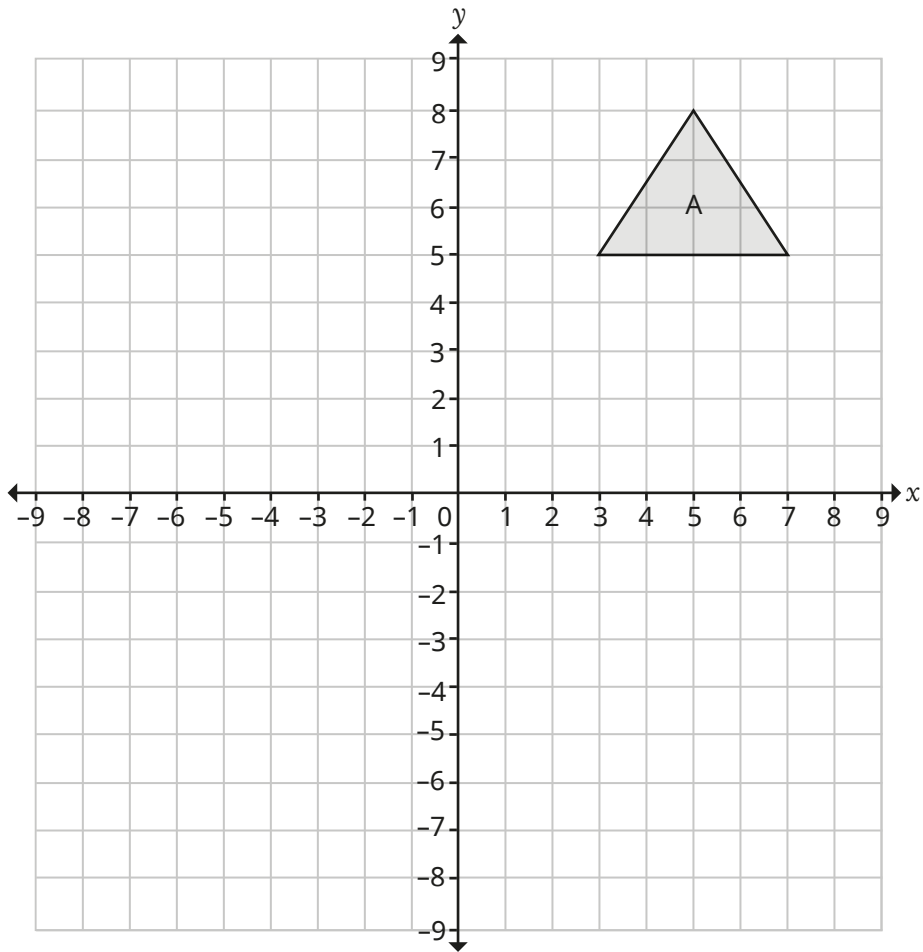
Explain why triangles ABE and ACD must be similar.

2 marks

Calculate the length of AD.

cm

2 marks



Triangle A is reflected in the y -axis to give triangle B.

Triangle B is translated by the vector $\begin{pmatrix} x \\ y \end{pmatrix}$ to give triangle C.

The coordinates of the vertices of triangle C are the same as the coordinates of the vertices of triangle A.

Find the values of x and y .

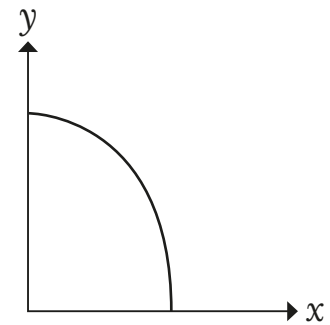
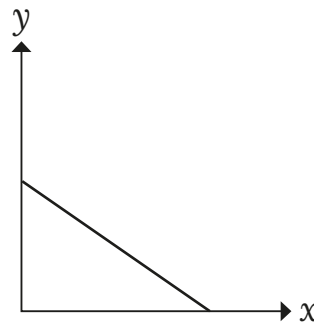
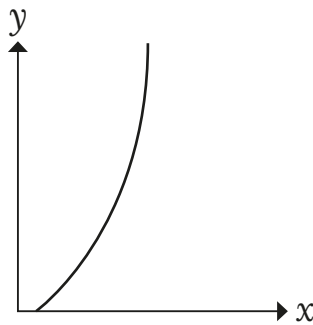
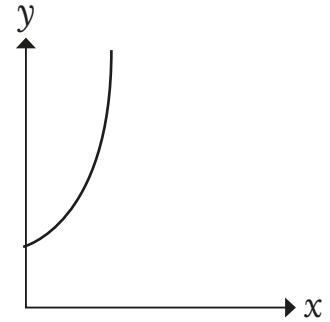
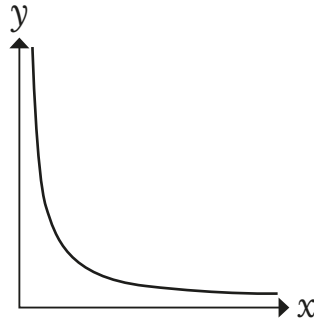
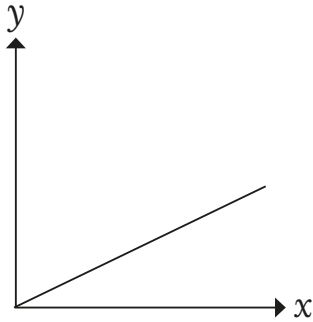
$x =$

$y =$

3 marks

5

Tick the box below the graph that shows that y is inversely proportional to x .



1 mark

6

A car's value decreases by 15% every year.

Circle the multiplier that you would use to find the value of the car after 3 years.

$\times 0.45$

$\times 0.85^3$

$\times 0.15^3$

$\times 0.3^{15}$

$\times 0.3^{85}$

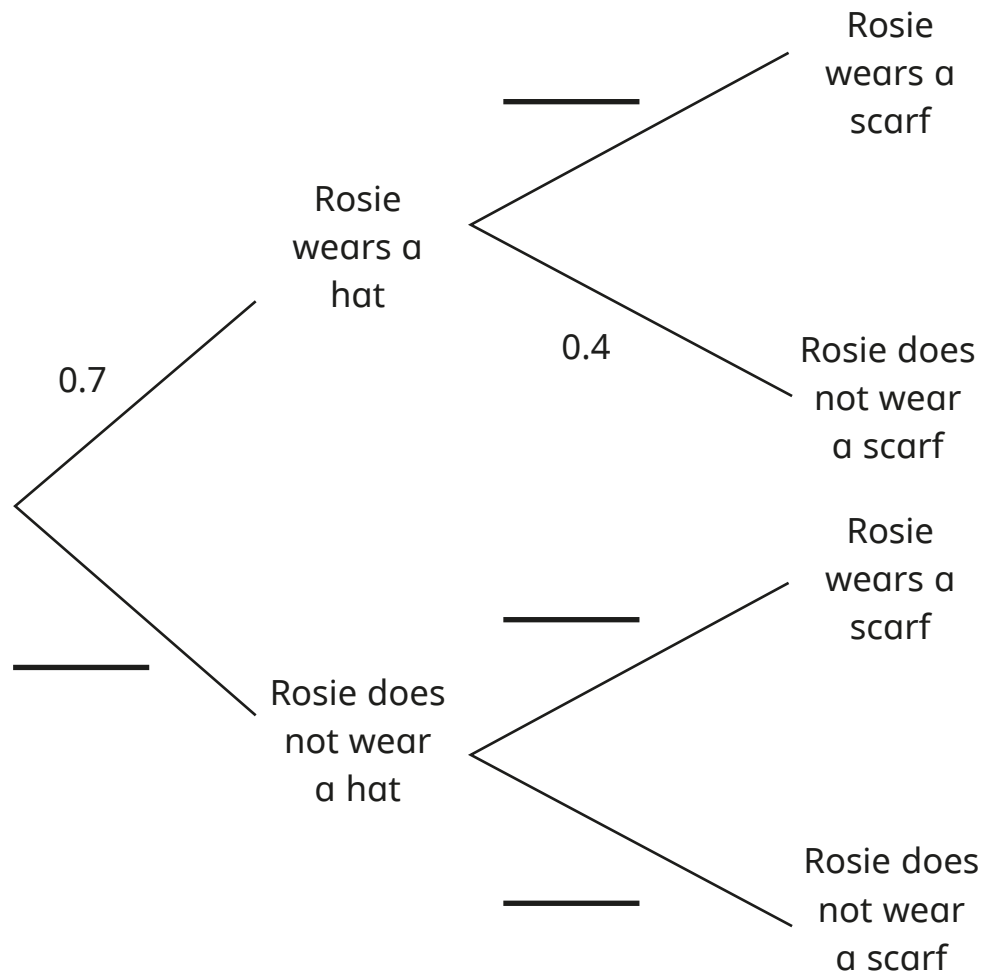
1 mark

7

The probability that Rosie wears a hat on a given day is 0.7
The probability that she does **not** wear a scarf on a given day is 0.4

Wearing a hat and wearing a scarf are independent.

Complete the tree diagram.



2 marks

Work out the probability that Rosie wears a hat and a scarf.

2 marks

8

The density of silver is 10.5 g/cm^3

Work out the density of silver in kg/m^3

kg/m^3

2 marks

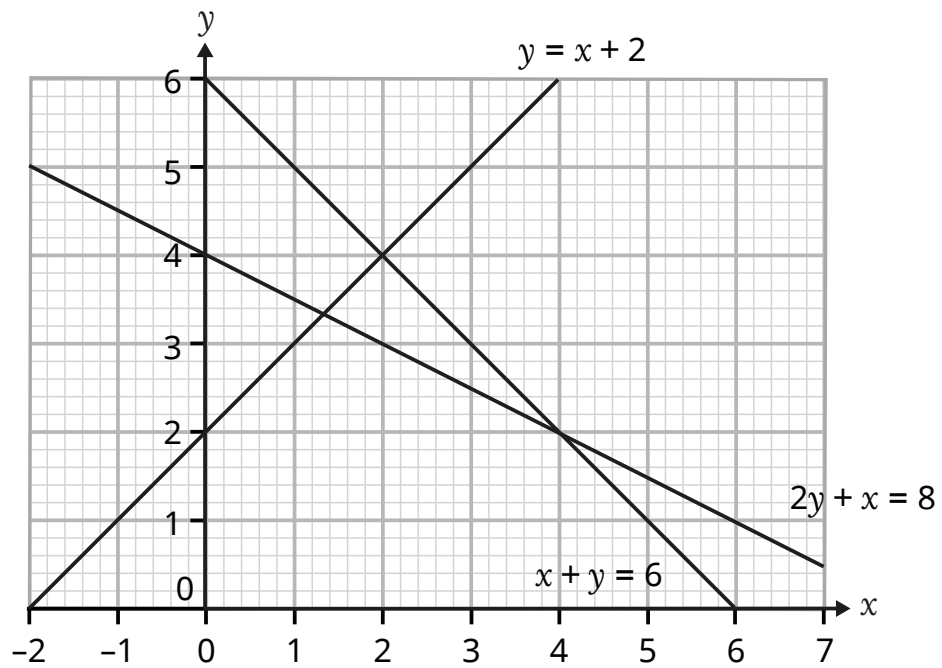
9

Kim and Mo share some sweets in the ratio 4 : 3

If Kim gives 2 sweets to Mo, they will have the same number of sweets.

How many sweets did they share?

3 marks



Solve the simultaneous equations.

$$2y + x = 8$$

$$x + y = 6$$

$x =$

$y =$

1 mark

Write the equation $2y + x = 8$ in the form $y = mx + c$.

2 marks

11

Each interior angle of a regular polygon is 150° .

How many sides does the regular polygon have?



2 marks

12

The edges of a cube are 6 cm long.

Show that the length of the longest diagonal of the cube is greater than 10 cm.

3 marks

13

Solve the equation.

$$10 - \frac{1}{3}x = 1$$

x =

2 marks**14**

Annie is investigating cube numbers.

$$\begin{aligned}2^3 &= 8 = 4 \times 2 \\10^3 &= 1000 = 4 \times 250 \\6^3 &= 216 = 4 \times 54\end{aligned}$$

She makes a conjecture.

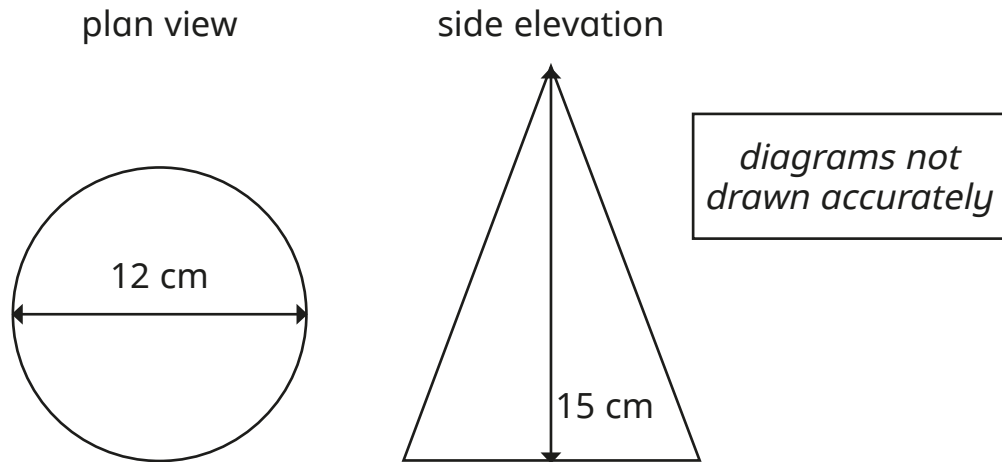
The cube of an even number is always a multiple of 4

Show that Annie's conjecture is correct.

2 marks

15

The diagram shows the plan and side elevation of a cone.



$$1 \text{ litre} = 1000 \text{ cm}^3$$

The volume, V , of a cone of radius r is given by the formula

$$V = \frac{1}{3}\pi r^2 h$$

Is the volume of the cone greater than 1 litre?

Circle your answer.

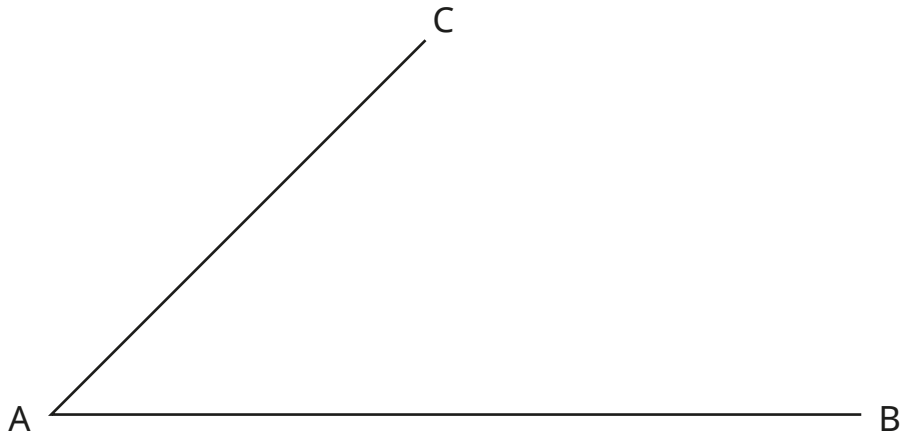
Yes

No

Show working to justify your answer.

16

The diagram shows line segments AB and AC.



Point P is:

- equidistant from AC and AB
- 5 cm from C
- more than 5 cm from A

Show the position of point P.

You must show your construction lines.

3 marks

END OF TEST