B

Year 9

Mathematics

Higher: No calculator allowed

Time allowed: 45 minutes

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

White Rose Maths
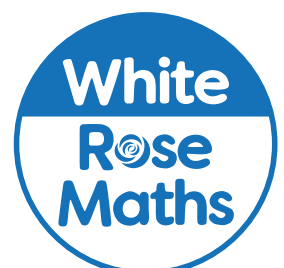
1 Points A and B lie on the straight line with equation $3x + y = 20$

Complete the coordinates of points A and B.

$$A = (3, \quad)$$

1 mark

$$B = (\quad , -1)$$

1 mark

2 Circle the equation of the straight line that is parallel to $2y + x = 10$
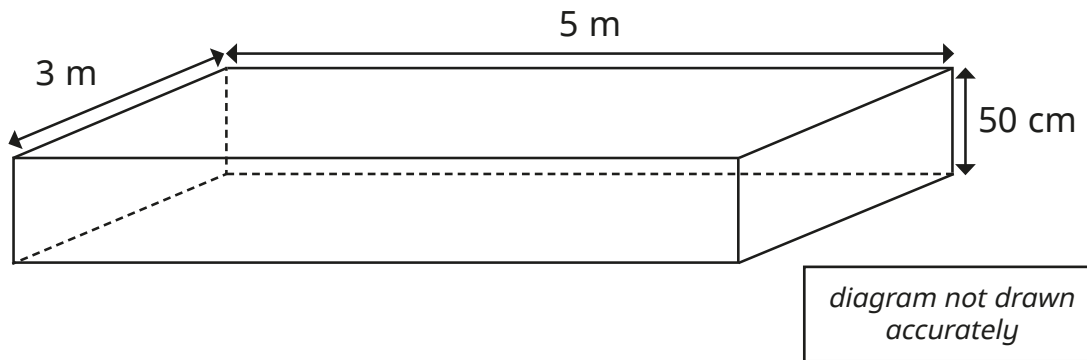
$2y + x = 12$ $\qquad$ $2y - x = 10$

$2x + y = 10$ $\qquad$ $2x - y = 10$

1 mark

3 The diagram shows an oil tank in the shape of a cuboid.

diagram not drawn accurately

The edges of the tank are covered in a special material that costs £12 per metre.

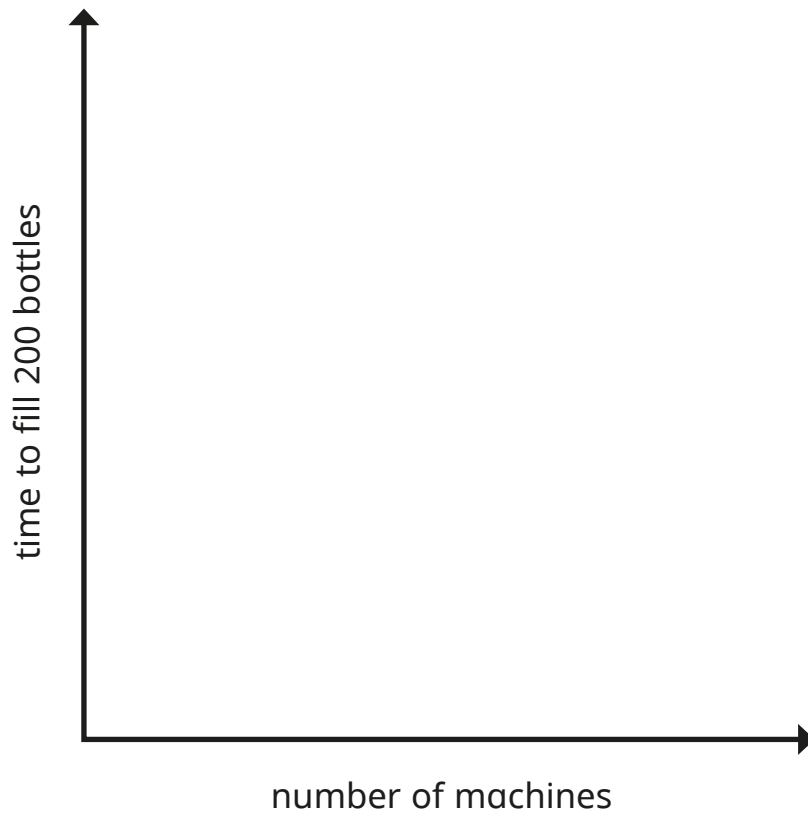Calculate the total cost of the material for this tank.

£

3 marks

4 A machine fills 200 bottles in an hour.

Working at the same rate, how long will it take five machines to fill 200 bottles?

Sketch a graph of the time taken to fill 200 bottles against the number of machines.

5 Solve the equations.

$11 = \dfrac{330}{x}$

$x =$

$\dfrac{1}{3}(2y + 1) + 4y = 12$

$y =$

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6 Express 576 as a product of its prime factors.

_____

2 marks

Alex says 576 is a perfect square.

Is Alex correct?

Circle your answer.

Yes   **No**

Explain your answer.

_____

1 mark

7 Show that $(2x + 3)(x - 5) + x(x + 7) + 9 \equiv 3(x^2 - 2)$.

3 marks

8 a and b are integers.

$a + b = 800$

b is 250 greater than a.

Work out the values of a and b.

$a =$ ☐ $b =$ ☐

2 marks

9 A rolling pin is made of two identical spheres attached to the ends of a cylinder.

The diameter of each sphere is 6 cm and the diameter of the cylinder is 6 cm.
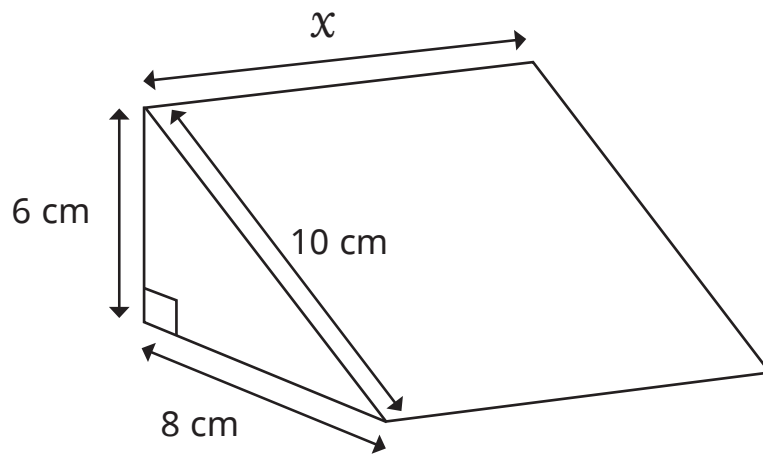
The length of the cylinder is 20 cm.

The volume, V, of a sphere of radius r is given by the formula $V = \frac{4}{3}\pi r^3$

> Find the total volume of the rolling pin.

cm³

x

6 cm

10 cm

8 cm

The volume of the triangular prism is 168 cm³

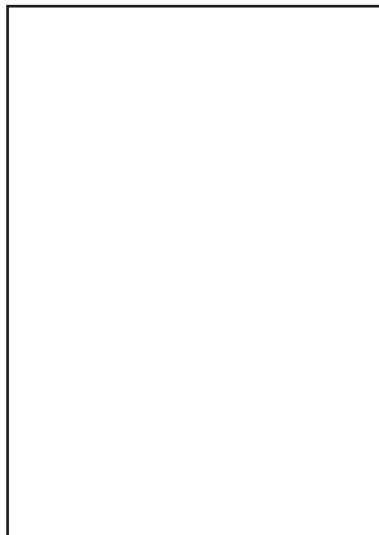Work out the surface area of the triangular prism.

cm²

3 marks

11 The scale drawing shows the plan view of a glass box that protects a statue.

A barrier is built so that no one can stand within 80 cm of the box.

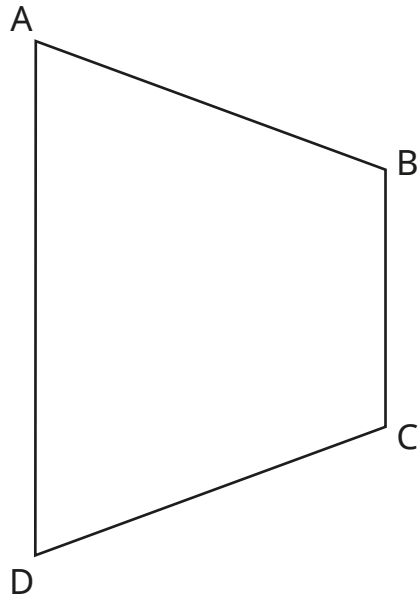Use a scale of 1 cm to 20 cm to draw the locus of the barrier on the scale drawing.

3 marks

12 Shade the region inside the trapezium that satisfies both conditions.

Condition 1	Condition 2
It is closer to CB than CD.	It is less than 4 cm from B.

A

B

C

D

13
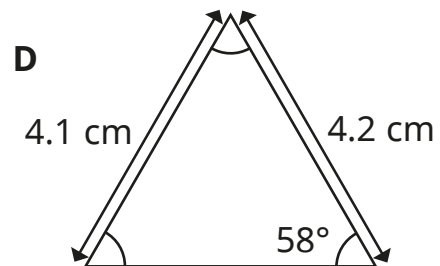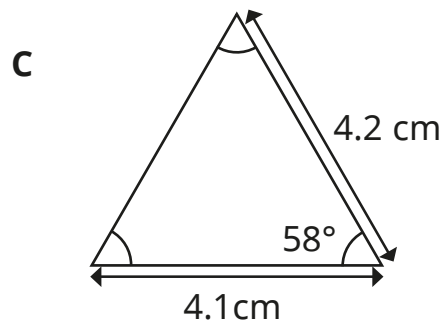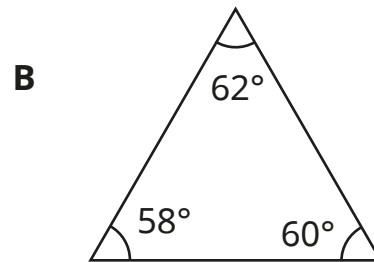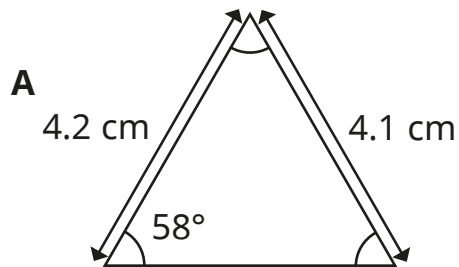
$$b = 4 + 5g^2$$

Rearrange the formula to make g the subject.

14 Identify the two pairs of triangles in the diagrams that must be congruent.

State the condition for congruency for each pair.

A
4.2 cm 4.1 cm
58°

B
62°
58° 60°

C
4.2 cm
58°
4.1cm

D
4.1 cm 4.2 cm
58°

E
4.2 cm 4.1 cm
4 cm

F
4.1 cm
58°
4.2 cm

G
4.1 cm 4 cm
4.2 cm

H
58°
61° 62°
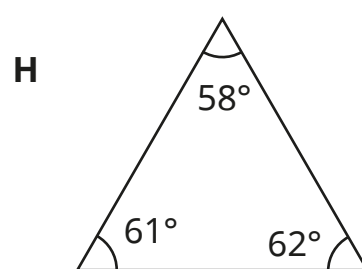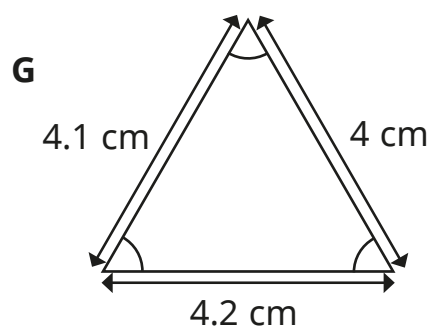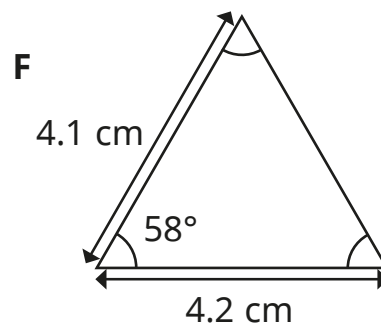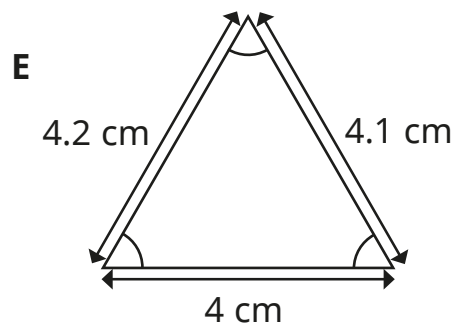
Triangle _____ is congruent to triangle _____

Condition for congruency: _____

Triangle _____ is congruent to triangle _____

Condition for congruency: _____

_____
4 marks

END OF TEST