
THE GRAMMAR SCHO
AT LEEDS
Be In

Arithmetic series

$$S_n = \frac{n}{2}(a + l)$$

The quadratic equation

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Trigonometry

In any triangle ABC

Sine Rule

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Cosine Rule

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

Area of triangle

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

Volume of prism

$$\text{area of cross section} \times \text{length}$$

Volume of cylinder

$$\pi r^2 h$$

1. (a) Express the following numbers as products of their prime factors.

(i) 60,

.....

(ii) 96.

.....

(4)

(b) Find the Highest Common Factor of 60 and 96.

.....

(1)

(c) Work out the Lowest Common Multiple of 60 and 96.

.....

(2)

(Total 7 marks)

2. (a) Simplify $5p + 2q – 3p – 3q$

.....

(2)

$$y = 5x – 3$$

(b) Find the value of x when $y = 4$

x = ...

(2)

(Total 4 marks)

3.

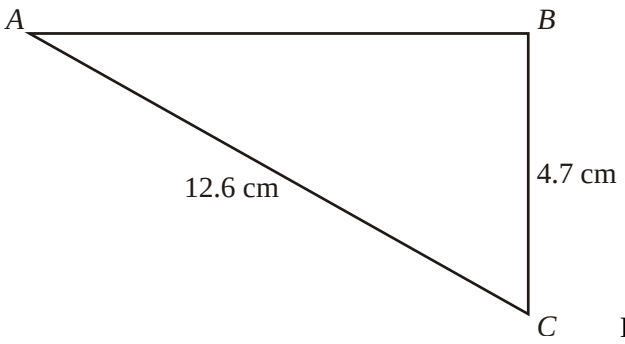


Diagram **NOT** accurately drawn

AC = 12.6 cm.
BC = 4.7 cm.
Angle ABC = 90°.

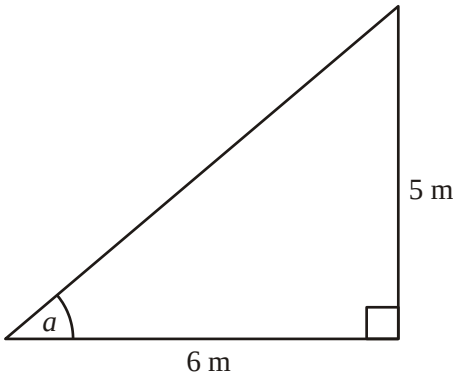
Calculate the length of AB.
Give your answer correct to 3 significant figures.

…….. cm

(Total 3 marks)

4. Calculate the size of angle *a* in this right-angled triangle.
Give your answer correct to 3 significant figures.

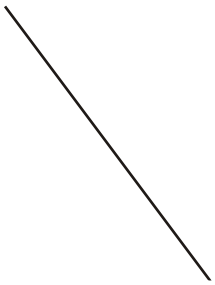
Diagram **NOT** accurately drawn



.....

(3)

5.



Calculate the volume of the triangular prism.

.....

(Total 4 marks)

6.

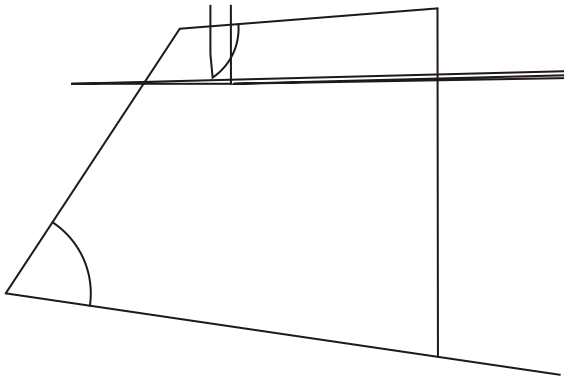


Diagram **NOT** accurately drawn

Work out the value of x.

x = ……...

(Total 3 marks)

7. The diagram shows a trapezium of height 3 m.

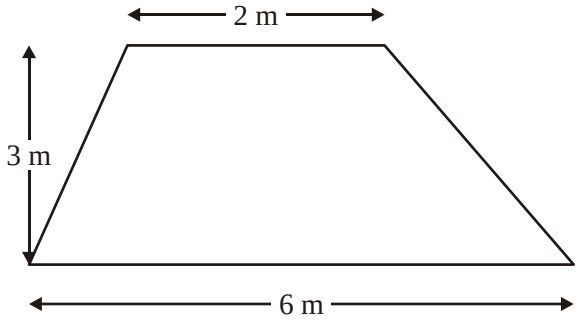


Diagram **NOT** accurately drawn

Find the area of this trapezium

State the units with our answer.

.....

(Total 3 marks)

8. Joe travelled 60 miles in 1 hour 30 minutes.

Work out Joe's average speed.
Give your answer in miles per hour.

..... miles per hour

(Total 2 marks)

9. A 10 pence coin is made from copper and nickel.
The ratio of the weight of copper to the weight of nickel is 18:6

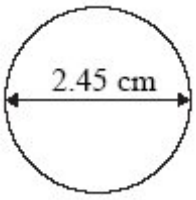
(a) Write the ratio 18:6 in its simplest form

…….

(1)

The diameter of the 10 pence coin is 2.45 cm.

(b) Work out the circumference of the coin.
Give your answer correct to 1 decimal place.



……cm

(2)

(Total 3 marks)

10. A man left home at 12 noon to go for a cycle ride.
The travel graph represents part of the man's journey.

At 12.45pm the man stopped for a rest.

(a) For how many minutes did he rest?

……minutes

(1)

(b) Find his distance from home at 1.30pm.

…….km

(1)

The man stopped for another rest at 2pm.

He rested for one hour.

Then he cycled home at a steady speed. It took him 2 hours.

(c) Complete the travel graph.

(2)

(Total 4 marks)

11. Work out an estimate for the value of $\frac{637}{3.2 \quad 9.8}$

……..

(Total 2 marks)

12. Simplify

(i) $p^2 \times p^7$

……

(ii) $x^8 \quad x^3$

……

(Total 2 marks)

13. Calculate 36% of £4500

£ ……...

(Total 2 marks)

14. (a) Expand $t(t \quad 2)$

.....

(1)

(b) Factorise $3y - 12$

.....

(1)
(Total 2 marks)

15. (a) Solve $7x + 18 = 74$

$x =$ ……

(2)

(b) Solve $4(2y - 5) = 32$

$y =$ ……

(2)

(c) Solve $5p + 7 = 3(4 - p)$

$p =$ ……

(3)
(Total 7 marks)

16. Simplify

……..……

(Total 2 marks)

17.

The diagram shows a shape.