

M3 PAPER A

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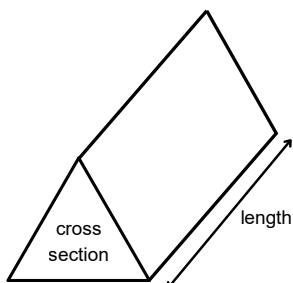
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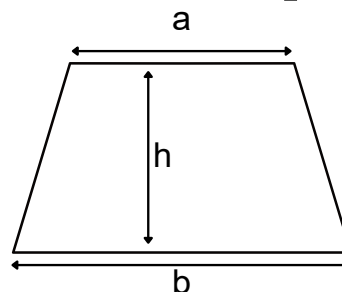


Formula Sheet

Volume of prism = area of cross section $\times$ length

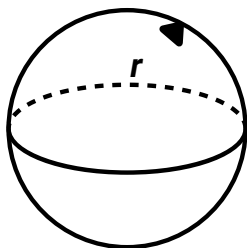


Area of a trapezium = $\frac{1}{2}(a + b)h$



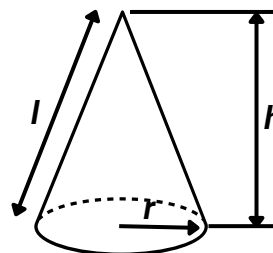
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



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

Curved surface area of cone = $\pi r l$

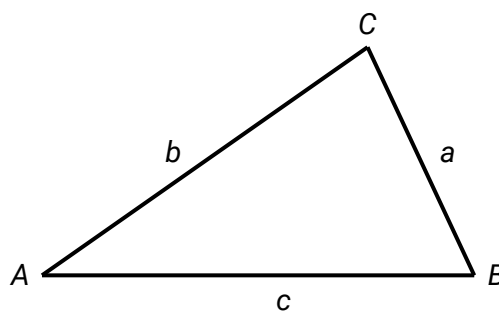


Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

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

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



1 a) Expand and simplify $4(2x - 5)(x + 3)$

Answer: _____ [3]

b) Factorise $y^2 - 36$

Answer: _____ [1]

2 a) Express 72 and 90 as a product of their prime factors.

Answer: 72 = _____ & 90 = _____ [2]



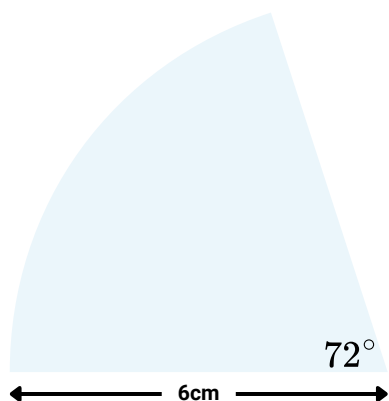
b) Find the HCF of 72 and 90.

Answer: _____ [2]

c) Find the LCM of 72 and 90.

Answer: _____ [2]

- 3 The diagram shows a sector of a circle. Find the perimeter of the sector.
Give your answer to 1 decimal place.



Answer: _____ [4]



4 A ladder leans against a vertical wall.

The ladder is 5 m long and makes an angle of 68° with the ground.

How high up the wall does the ladder reach?

Give your answer correct to 1 decimal place.

Answer: _____ m[3]

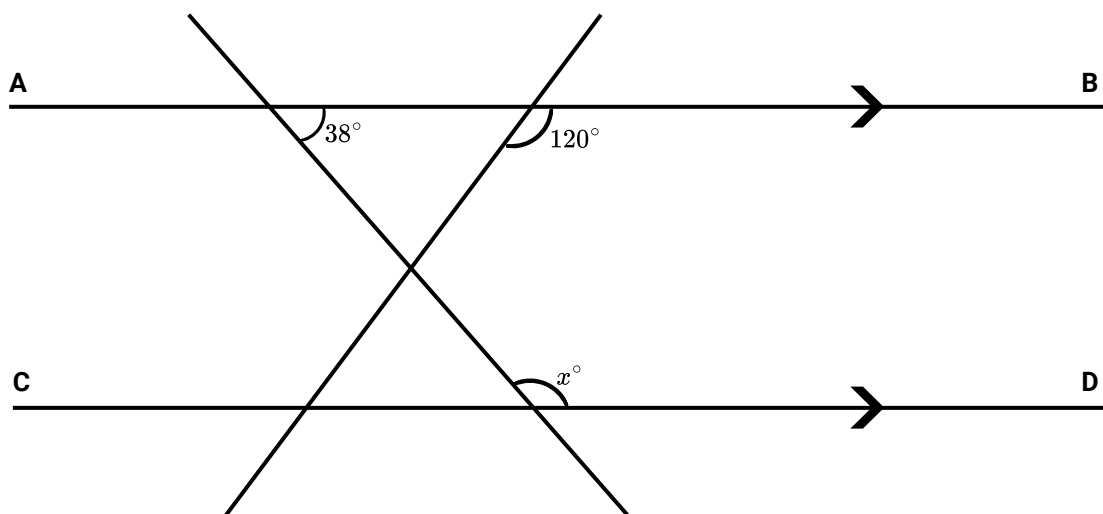
5 After a 20% reduction, the price of a phone is £240.

Find the original price of a phone.

Answer: £_____ [3]



6



AB and CD are parallel lines.

a) Find the size of angle x

Answer: _____ [1]

b) Give a reason for your answer:

[2]

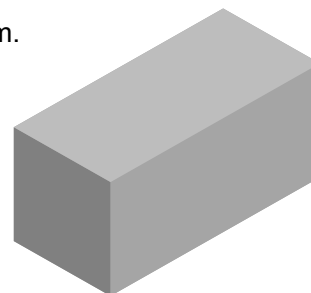


7 A block is placed on the ground.

The block has a weight of 360N and a base measuring 6cm by 5cm.

Calculate the pressure on the ground.

Give your answer in N/cm^2 .



Answer: _____ [3]

8 A lift has a maximum capacity of 490kg to the nearest 10kg. Five people all weigh 95kg each to the nearest 5kg.

Can all five people use the lift together safely?

You must show your working and give a reason for your answer.

Answer: _____ [4]



9 a) Solve $5x - 3 = -3x + 29$

Answer _____ [2]

b) Solve $x^2 - 5x - 6 = 0$

Answer _____ [2]

c) Simplify fully $\frac{x^2 + 4x}{x^2 - x - 20}$

Answer _____ [2]



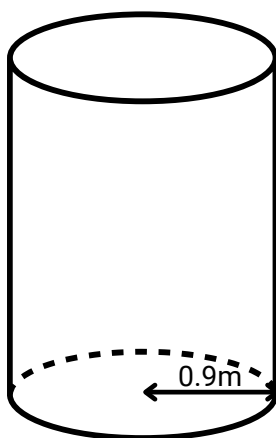
10 a) Some concrete has volume 2.7 m^3

The density of the concrete is 2500 kg/m^3

Work out the mass of the concrete.

Answer _____ kg [2]

b) The 2.7 m^3 of concrete is made into the shape of a cylinder.
The base has radius 0.9 metres



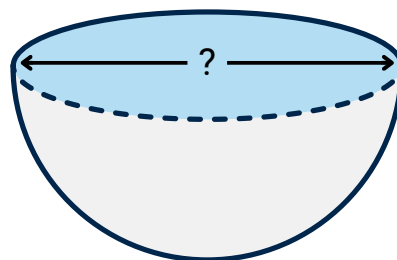
Work out the height of the cylinder.

Answer _____ m [2]



11

The total surface area of a solid hemisphere is $192\pi \text{ cm}^2$.
Work out the diameter of the hemisphere.



Answer _____ [3]

12

Find the equation of the line that passes through the points (2,5) and (6,13)

Answer _____ [3]



13

Here is a list of 11 integers in ascending order.

The lower quartile, median, upper quartile and highest value are missing.

5	8		12	14		18	20		25	
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- The median is 1.6 times the lower quartile.
- The upper quartile is 2.2 times the lower quartile.
- The range is 2 times the interquartile range.

Complete the list by writing the missing values in the boxes.

[4]

Answers

