

M7 PAPER A

NI TUTORING SCHOOL

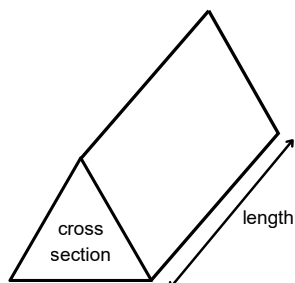
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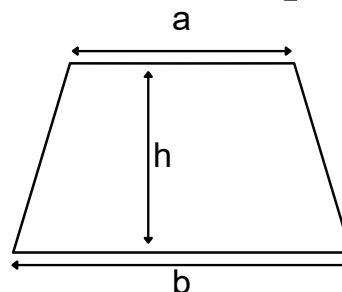


Formula Sheet

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

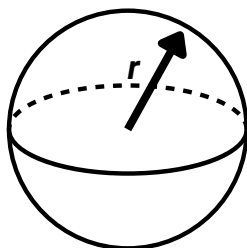


Area of a trapezium = $\frac{1}{2}(a + b)h$



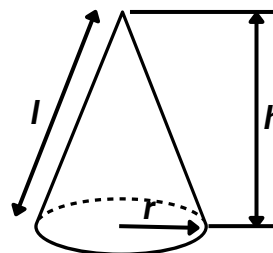
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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

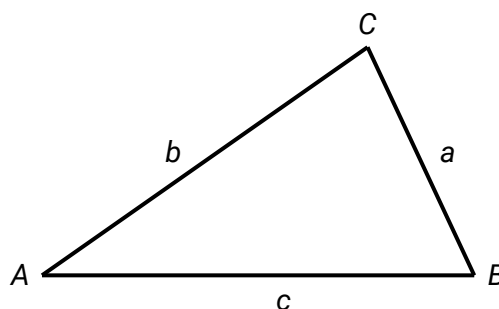


Quadratic Equation

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 square has sides of length 4×10^4 m.



What is the area of the square? Give your answer in standard form.

Answer_____ [3]

- 2 a) Simplify $(2x^{-3})^2$

Answer_____ [2]

- b) Evaluate 2^{-3}



Answer_____ [2]



3 a) Make x the subject of $y = \sqrt[3]{x} + 4$

Answer_____ [2]

b) Make x the subject of $y + 4x = 5 - ax$

Answer_____ [3]

4 Find an expression for the n th term of the sequence:

3, 6, 11, 18, 27

Answer_____ [3]



- 5 Solve the simultaneous equations.

$$2x + 3y = 53$$

$$3x - y = 19$$



Do not use trial and improvement.
You must show your working.

Answer _____ [4]

- 6 A student is choosing an outfit.

They have:

- 5 T-shirts
- 3 pairs of trousers
- 2 pairs of shoes

How many different outfits can they make?

Answer _____ [2]



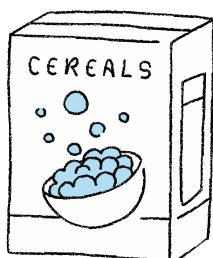
7 Two cereal boxes are mathematically similar.

The surface area of the smaller box is 200 cm^2 .

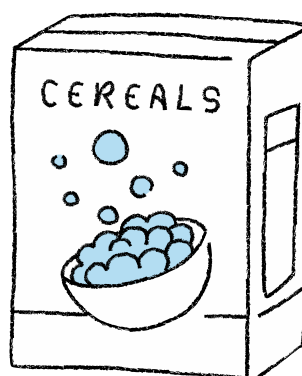
The surface area of the larger box is 450 cm^2 .

The volume of the smaller box is 320 cm^3 .

Find the volume of the larger box.



- Surface Area 200 cm^2
- Volume 320 cm^3 .

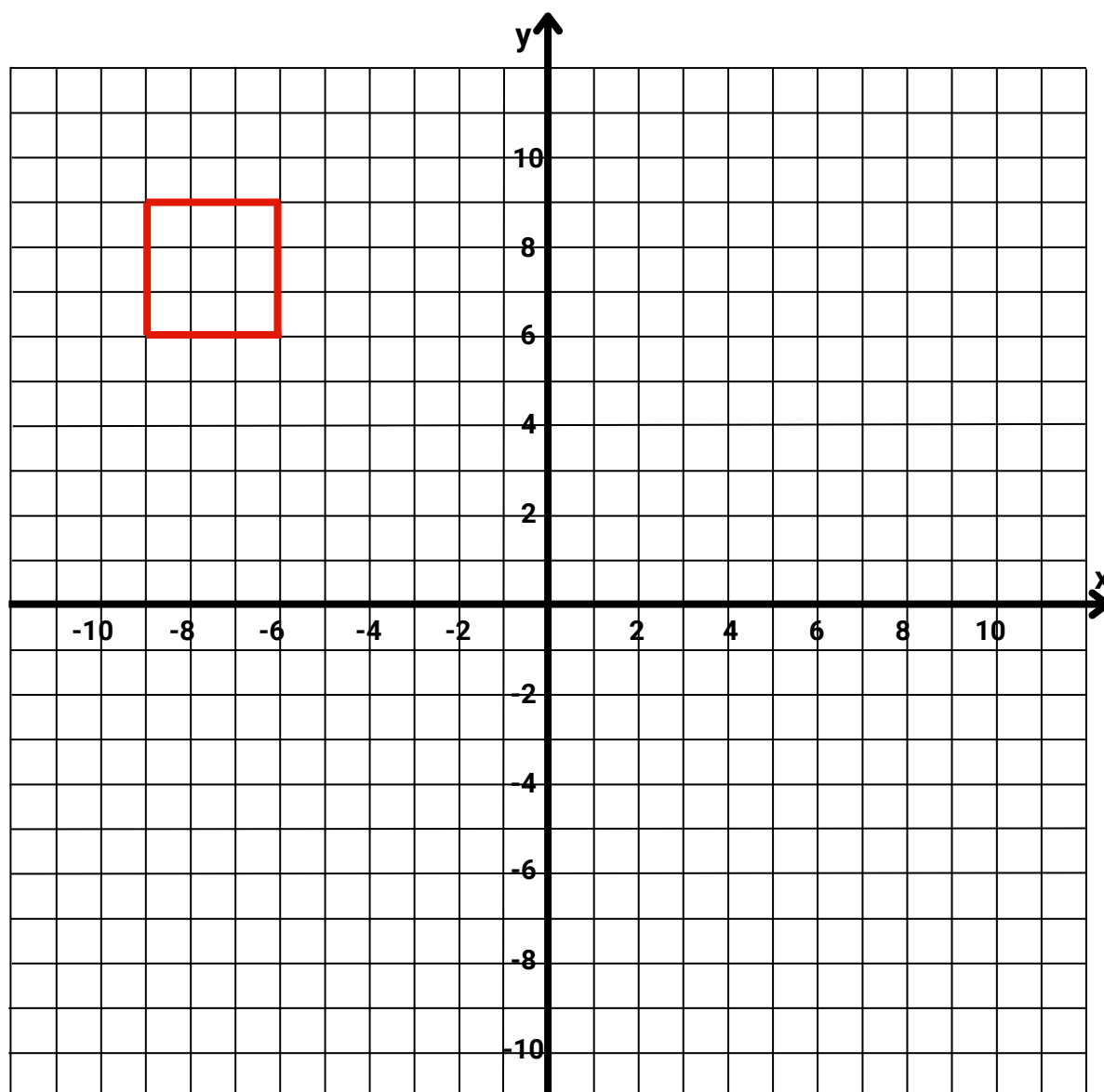


- Surface Area 450 cm^2

Answer _____ [3]



- 8 Enlarge the shape by scale factor $\frac{1}{3}$ about the origin.



[3]



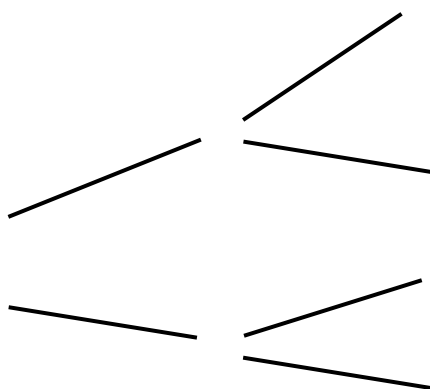
- 9 A bag contains 4 red counters and 3 blue counters.



A counter is chosen at random, its colour is recorded, and then it is replaced.

A second counter is then chosen.

- a) Complete the tree diagram and label all probabilities.



[2]

- b) Find the probability of getting two red counters

Answer _____ [1]

- c) Find the probability of getting at least one blue.

Answer _____ [2]



9

A sphere has a radius of 3cm.

Find the volume of the sphere.

Give your answer in terms of π .



Answer _____ [3]

10

A right angled triangle has sides of 4cm and 6cm.

Find the length of the hypotenuse.

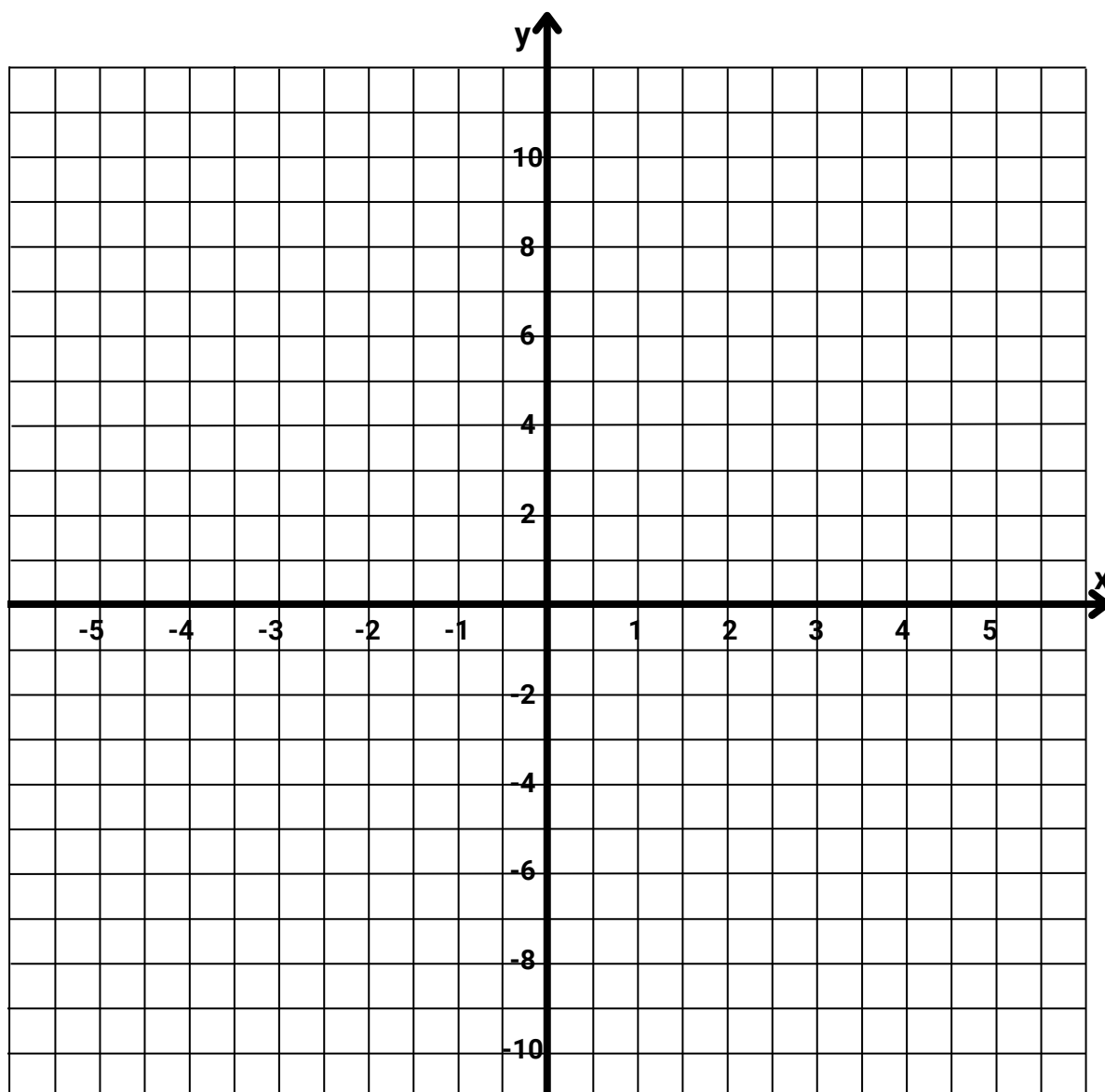
Give your answer in simplest surd form.



Answer _____ [3]



11 a) Draw the graph of $y = x^2 - 2x - 8$



[2]

b) Use your graph to solve: $2 = x^2 - 2x - 8$

Answer _____ [2]



12 T varies as the square of y.
When $y = 4$, $T = 48$

a) Express T in terms of y.

Answer _____ [3]

b) Find a value of y for which $T = 75$

Answer _____ [2]

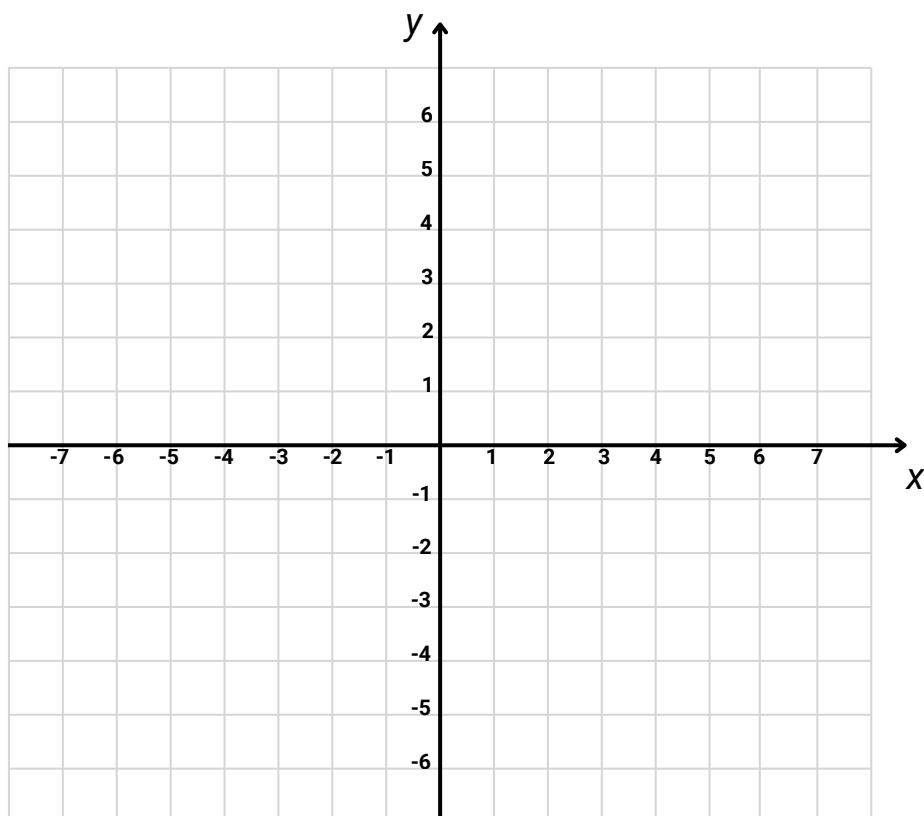


13 On the grid, show the region that satisfies all of the following inequalities

$$x < 2$$

$$-3 < y < 4$$

$$y \leq -x + 4$$



[3]

Answers

