Name: _____

GCSE (1 – 9)

Similar Shapes (Area and Volume)

Instructions

• Use **black** ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
• You must **show all your working out.**

Information

• The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
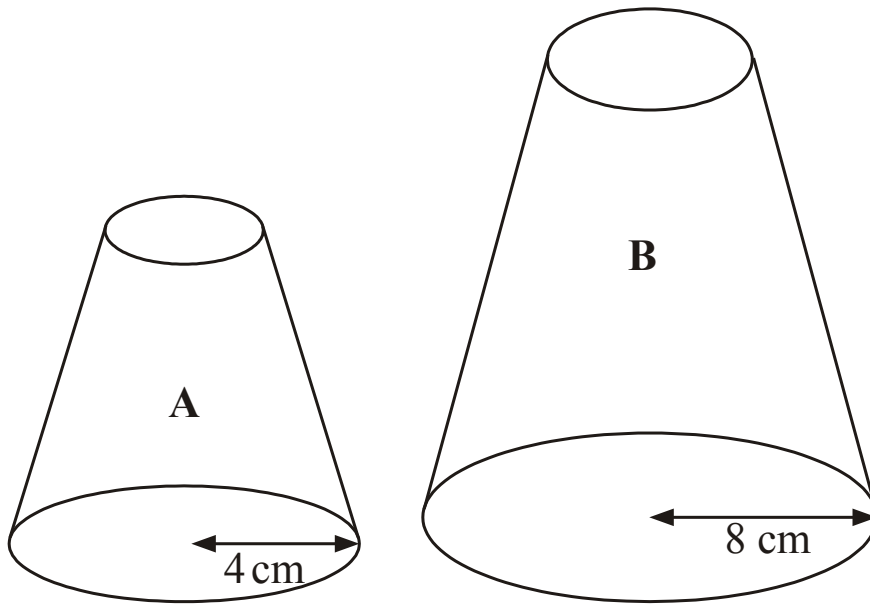• Check your answers if you have time at the end

1.

Diagram NOT accurately drawn

Two solid shapes, A and B, are mathematically similar.
The base of shape A is a circle with radius 4 cm.
The base of shape B is a circle with radius 8 cm.
The surface area of shape A is 80 cm^2.
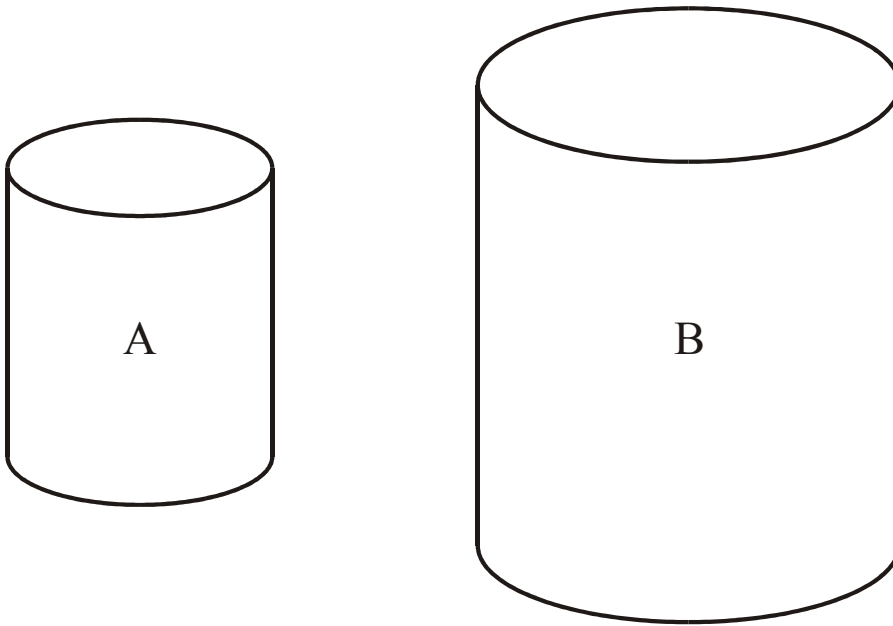
(a) Work out the surface area of shape B.

.... cm^2 (2)

The volume of shape B is 600 cm^3.

(b) Work out the volume of shape A.
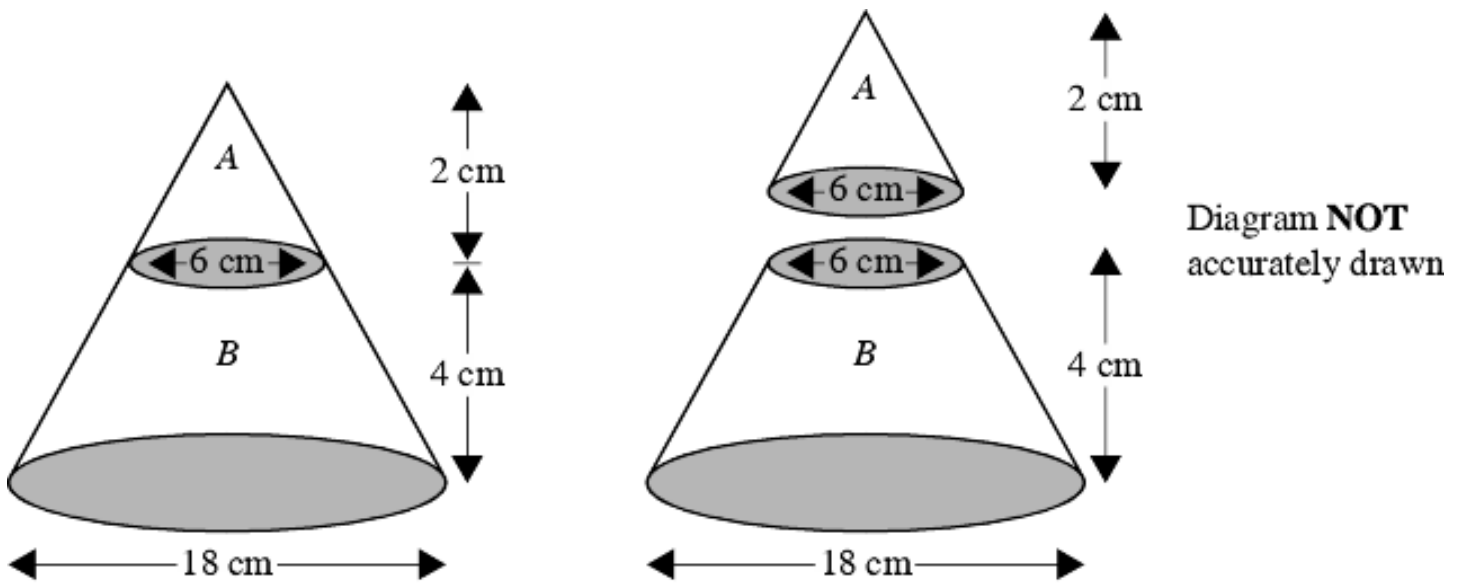
.... cm^3 (2)

2.

The two cylinders, A and B, are mathematically similar.
The height of cylinder B is twice the height of cylinder A.
The total surface area of cylinder A is 180 cm^2.

Calculate the total surface area of cylinder B.

.... (3)

3.

Diagram **NOT** accurately drawn

The diagram represents a large cone of height 6 cm and base diameter 18 cm.

The large cone is made by placing a small cone A of height 2 cm and base diameter 6 cm on top of a frustum B.

Calculate the volume of the frustum B.
Give your answer in terms of π .

.... (4)
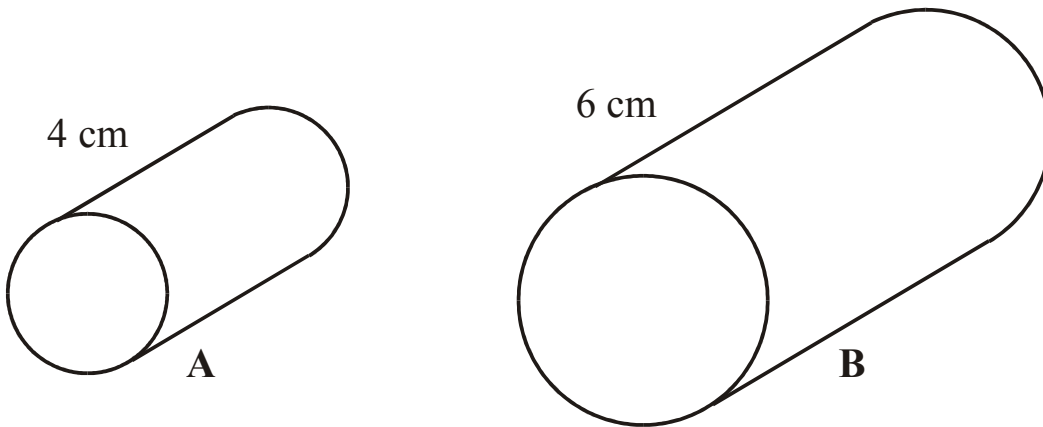
4.

4 cm

6 cm

A

B

Diagram **NOT** accurately drawn

Cylinder A and cylinder B are mathematically similar.

The length of cylinder A is 4 cm and the length of cylinder B is 6 cm.

The volume of cylinder A is 80 cm^3.

Calculate the volume of cylinder B.

.... cm^3 (3)

5.

X and Y are two geometrically similar solid shapes.

The total surface area of shape X is 450 cm^2.
The total surface area of shape Y is 800 cm^2.

The volume of shape X is 1350 cm^3.
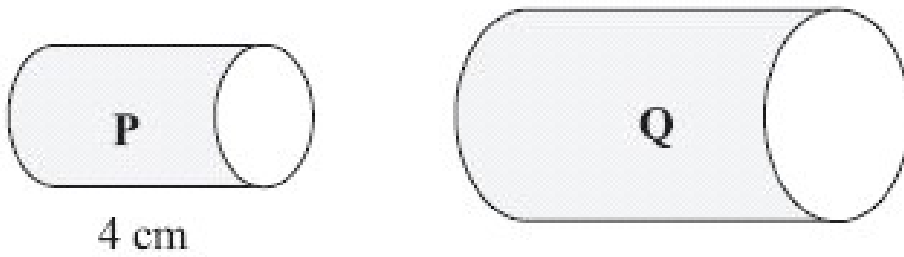
Calculate the volume of shape Y.

.... cm^3 (3)

6.

P

Q

4 cm

Two cylinders, P and Q, are mathematically similar.

The total surface area of cylinder P is 90π cm^2
The total surface area of cylinder Q is 810π cm^2

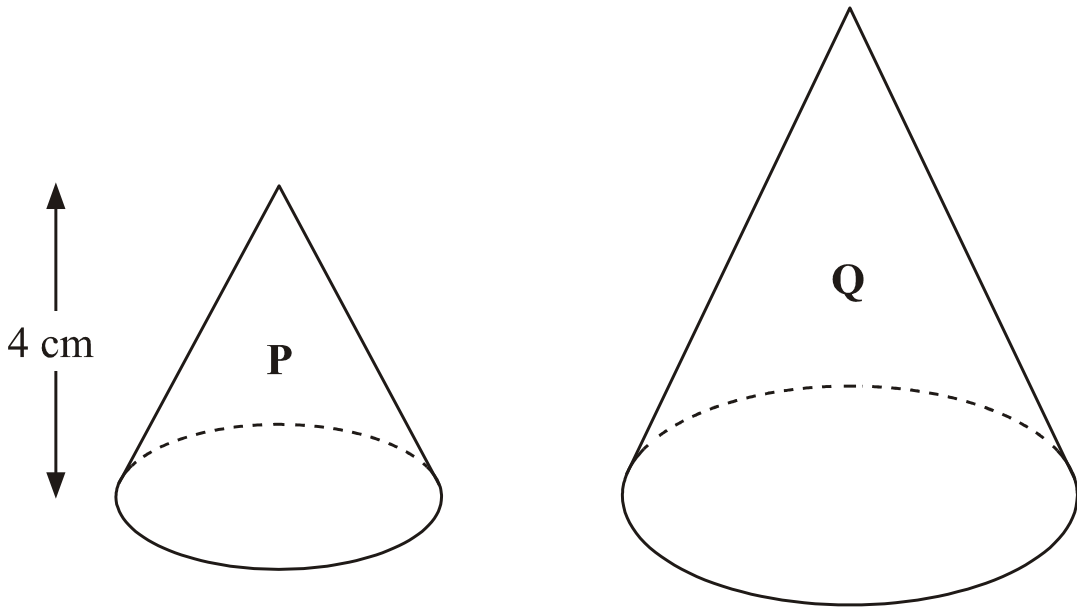The length of cylinder P is 4 cm.

(a)   Work out the length of cylinder Q.

.... cm   (3)

The volume of cylinder P is 100π cm^3

(b)   Work out the volume of cylinder Q.
Give your answer as a multiple of π.

.... cm^3 (2)

7.

Two cones, P and Q, are mathematically similar.

The total surface area of cone P is 24 cm^2.
The total surface area of cone Q is 96 cm^2.

The height of cone P is 4 cm.

(a)   Work out the height of cone Q.

.... cm   (3)

The volume of cone P is 12cm^3

(b)   Work out the volume of cone Q.

.... cm^3 (2)