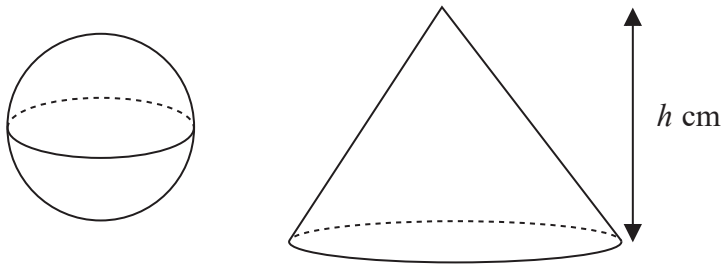**19** The diagram shows a sphere and a cone.

Diagram **NOT** accurately drawn

h cm

The cone has height h cm.
The radius of the base of the cone is 3 times the radius of the sphere.

Given that the volume of the sphere is equal to the volume of the cone,
find an expression for the radius of the sphere in terms of h.
Give your expression in its simplest form.

....

(Total for Question 19 is 3 marks)

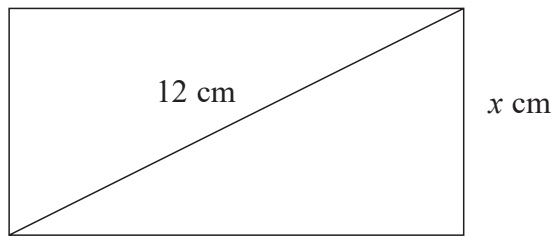*Turn over* ▶

22 The diagram shows a rectangle.

Diagram **NOT** accurately drawn

12 cm

x cm

The width of the rectangle is x cm.
The length of a diagonal of the rectangle is 12 cm.

The perimeter of the rectangle is 28 cm.

Find the possible values of x.
Give your values correct to 3 significant figures.
Show your working clearly.

....

(Total for Question 22 is 7 marks)

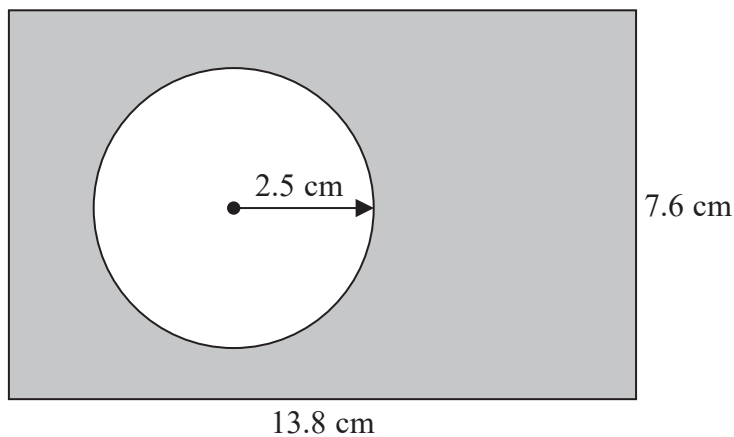**10** The diagram shows a circle inside a rectangle.

Diagram **NOT** accurately drawn

2.5 cm

7.6 cm

13.8 cm

Work out the area of the shaded region.
Give your answer correct to 3 significant figures.

.... cm²

(Total for Question 10 is 3 marks)
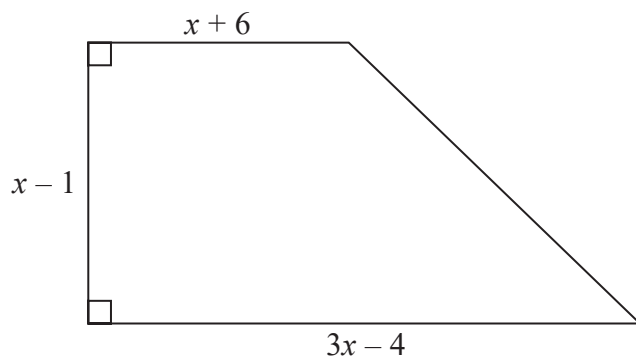
17 The diagram shows a trapezium.

Diagram **NOT**
accurately drawn

All measurements on the diagram are in centimetres.

The area of the trapezium is 119 cm^2

(i) Show that $2x^2 - x - 120 = 0$

(ii) Find the value of x.
Show your working clearly.

$x = $ ....

(Total for Question 17 is 6 marks)

Turn over ▶

P 4 5 8 4 1 A 0 1 9 2 4

20 A metal cube has sides of length 4.5 cm, correct to the nearest 0.5 cm.

The cube is melted down and the metal is used to make small spheres.
Each sphere has a radius of 3 mm, correct to the nearest millimetre.

Work out the greatest number of spheres that could be made from the metal.
Show your working clearly.

....

(Total for Question 20 is 5 marks)

22 The diagram shows a pentagon.

Diagram **NOT** accurately drawn

12 cm 12 cm

105° 105°

8 cm 8 cm

13 cm
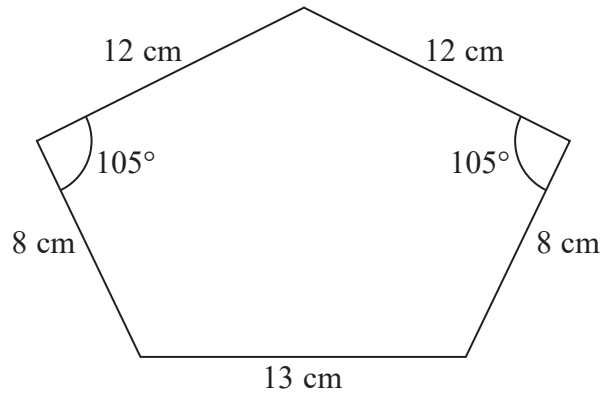
Work out the area of the pentagon.
Give your answer correct to 3 significant figures.

.... cm²

(Total for Question 22 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

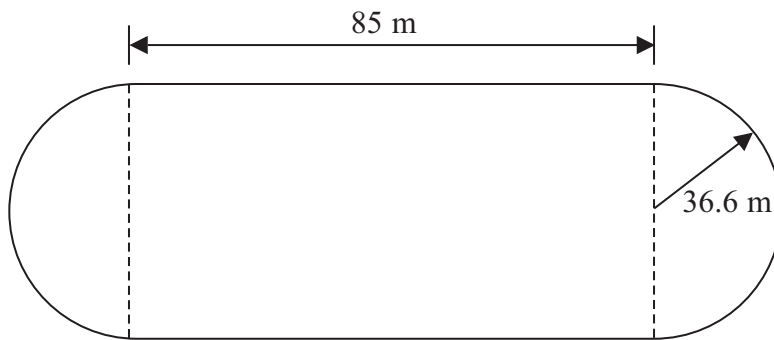**10** The diagram shows the path of an athlete on a running track.

85 m

Diagram **NOT**
accurately drawn

36.6 m

The path consists of two straight lengths and a semicircle at each end.
Each straight length is 85 metres.
Each semicircle has a radius of 36.6 metres.

Calculate the area enclosed by the path.
Give your answer correct to 3 significant figures.

.... m²

(Total for Question 10 is 4 marks)

Do NOT write in this space.
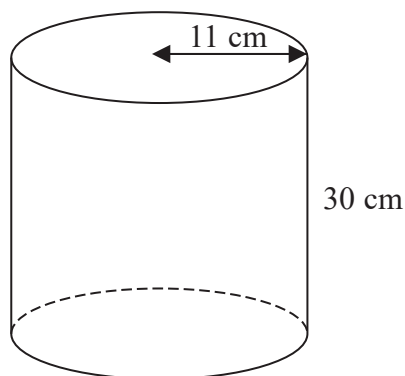
10 The diagram shows a solid cylinder.

Diagram **NOT**
accurately drawn

The cylinder has a height of 30 cm and a radius 11 cm.

(a) Work out the **total** surface area of the cylinder.
Give your answer correct to 2 significant figures.

.... cm²

(4)

(b) The height of the cylinder is 30 cm, correct to the nearest centimetre.

(i) Write down the lower bound of the height of the cylinder.

.... cm

(ii) Write down the upper bound of the height of the cylinder.

.... cm

(2)

(Total for Question 10 is 6 marks)