

IGCSE higher course homework week 11

For all the questions below round your answers to 3 significant figures unless asked to do otherwise

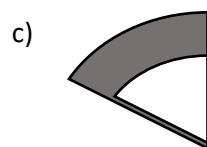
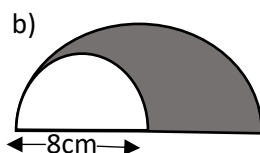
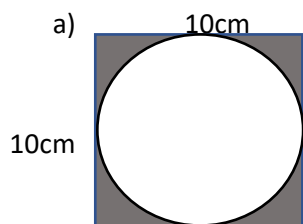
- 1 Look at your formula sheets, which formulas do you need to learn and which will be given to you in the exam?
 Make sure you put formulas you need to learn into your notebook
 Make sure you know how to use all the formulas!

- 2 Convert the following measurements start by writing your conversions

(another thing that will need to go into your notebook!)

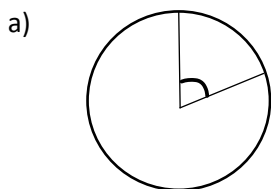
- a) $2\text{cm}^2 = \text{mm}^2$ b) $50,000\text{mm}^2 = \text{cm}^2$ c) $7\text{m}^2 = \text{cm}^2$ d) $23,000\text{cm}^2 = \text{m}^2$
 e) $780,000\text{mm}^3 = \text{cm}^3$ f) $3.4\text{cm}^3 = \text{mm}^3$ g) $4,520,000\text{cm}^3 = \text{m}^3$ h) $0.83\text{m}^3 = \text{cm}^3$

- 3 Work out the shaded areas

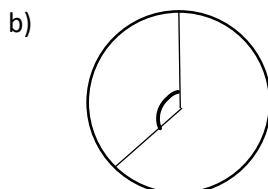


outer radius = 6cm
 inner radius = 4cm
 angle = 40°

- 4 Find the radius of the following from the given information

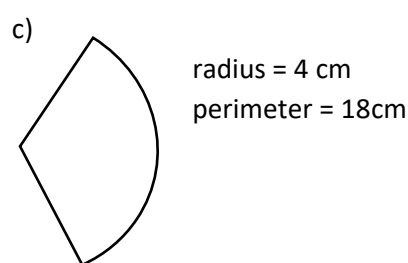
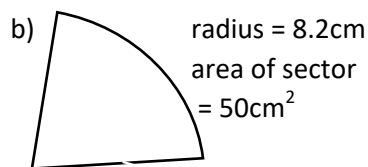
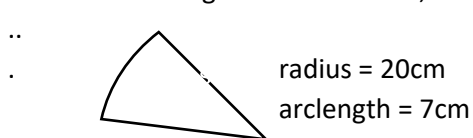


Arc length = 7.85cm
 angle = 70°



Area of sector = 100cm^2
 angle = 150°

- 5 What are the angles of the sectors, round to the nearest whole number



- 6 Find the volumes for the following shapes

- a) a cube of side length 5cm b) a cuboid of side length 4cm, 6cm and 5.5cm
 c) a cylinder of radius 4cm and height 9cm d) a sphere of radius 5 cm
 e) a cone of height 12cm and radius 4cm f) a hemisphere of diameter 8.2mm
 g) a square based pyramid of side length 8cm and height 6cm

- 7 Work out the surface area for the following shapes

- a) a cube of side length 8cm b) a cylinder of radius 7cm and height 3cm
 c) a sphere of radius 3 cm d) a hemisphere of diameter 15 cm

- 8 A cone has a radius of 6cm and a slanting length of 8cm
 Work out a) the curved surface area of the cone

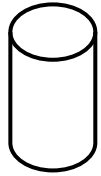
- b) the total surface area

- 9 An ice cream consists of a hemisphere on top of a cone
 Both the hemisphere and the cone have radius's of 3.8cm
 The cone has a height of 10.5cm
 Work out the total volume of the icecream and cone

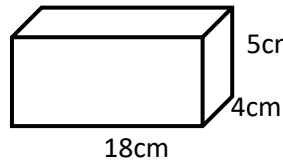


- 10 A cylinder has a volume of 185cm^3
 If the height of the cylinder is 16cm, find the radius of the cylinder

- 11 A cylinder containing water is poured into a cuboid shaped tank, how high up the sides of the tank does the water reach



$r = 2.5 \text{ cm}$
 $h = 8 \text{ cm}$



(note IGNORE height of tank, you are finding height of water)

- 12 A flat roof is a rectangle measuring 10m by 7.5m.

When it rains, the rain from the roof flows into a cylindrical water tank of radius 65cm

If **1cm** of rain falls how much does the water level in the tank rise?

(hint: work out volume of water on roof first)

- 13 A metal sphere of radius 7mm is placed into a beaker of water, the beaker is of radius 2cm, what is the rise in the water level?

- 14 A cone has a volume of 603 cm^3 and a radius of 8cm work out the height of the cone

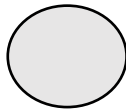
- 15 A sphere has a volume of 524 cm^3
a) work out the radius of the sphere

b) now work out the surface area of the sphere

- 16 A cylinder and a sphere have the same volume

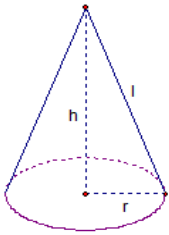


$r = 4 \text{ cm}$
 $h = 12 \text{ cm}$



work out the radius of the sphere

17



A cone has a height of 8cm and a radius of 6cm

a) Work out the slanting length of the cone

b) work out the total surface area of the cone

- 18 A cone has a curved surface area of 70 cm^2

a) work out the slanting length of the cone

b) work out the height of the cone

c) work out the volume of the cone

The cone's radius is 3.4cm

- 19 A cone has a volume of 250 cm^3

Work out the total surface area of the cone

The height of the cone is 8.8cm

- 20 A cylinder has a radius of 6.3cm and a height of 7.5cm
both measurements are correct to 2 significant places

Find the upper bound of the volume of the cylinder

- 21 A cone has a radius of $2r$ and a height of $3r$

Express the volume in terms of r (hint substitute the radius and height into the volume formula and simplify)

- 22 The diagram shows a cylinder and a sphere

The cylinder has a radius of $2r$ cm and a height of h cm

The sphere has a radius of $3r$ cm

The volume of the cylinder is equal to the volume of the sphere

Find an expression for h in terms of r

Give your answer in it's simplest form

