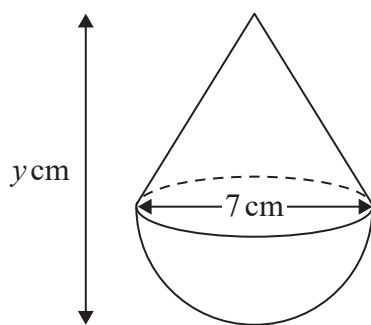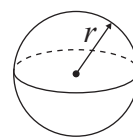# GCSE Grade 7

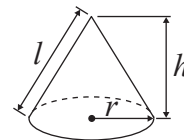# Maths Booklet 3

Paper 2H
Calculator

www.ggmaths.co.uk

1 A solid cone is joined to a solid hemisphere to make the solid **T** shown below.

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

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

The diameter of the base of the cone is 7 cm.
The diameter of the hemisphere is 7 cm.

The total volume of **T** is 120π cm³
The total height of **T** is y cm.

(a) Calculate the value of y.
   Give your answer correct to 3 significant figures.

$y = $ ....
   (4)

The diameter of the base of the cone and the diameter of the hemisphere are both increased by the same amount.
Assuming the total volume of **T** does not change,

(b) explain the effect this would have on your answer to part (a).

....

....

....

   (1)

(Total for Question 1 is 5 marks)

2 Sakira invested £3550 in a savings account for 3 years.

She was paid 2.6% per annum compound interest for each of the first 2 years.
She was paid R% interest for the third year.

Sakira had £3819.21 in her savings account at the end of the 3 years.

Work out the value of R.
Give your answer correct to 1 decimal place.

....

(Total for Question 2 is 3 marks)

3 Sadia is going to buy a new car.
For the car, she can choose one body colour, one roof colour and one wheel type.

She can choose from
19 different body colours
25 different wheel types

The total number of ways Sadia can choose the body colour and the roof colour and the wheel type is 3325

Work out the number of different roof colours that Sadia can choose from.

....

(Total for Question 3 is 2 marks)

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

....

(Total for Question 4 is 3 marks)

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5 Marek has 9 cards.
There is a number on each card.

$$\boxed{1}\ \boxed{2}\ \boxed{3}\ \boxed{4}\ \boxed{5}\ \boxed{6}\ \boxed{7}\ \boxed{8}\ \boxed{9}$$
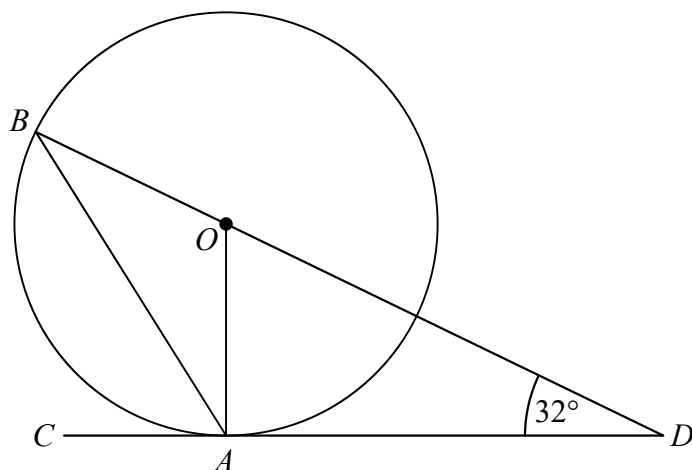
Marek takes at random two of the cards.
He works out the product of the numbers on the two cards.

Work out the probability that the product is an even number.

....

(Total for Question 5 is 3 marks)

6

A and *B* are points on a circle with centre *O*.
CAD is the tangent to the circle at *A*.
BOD is a straight line.
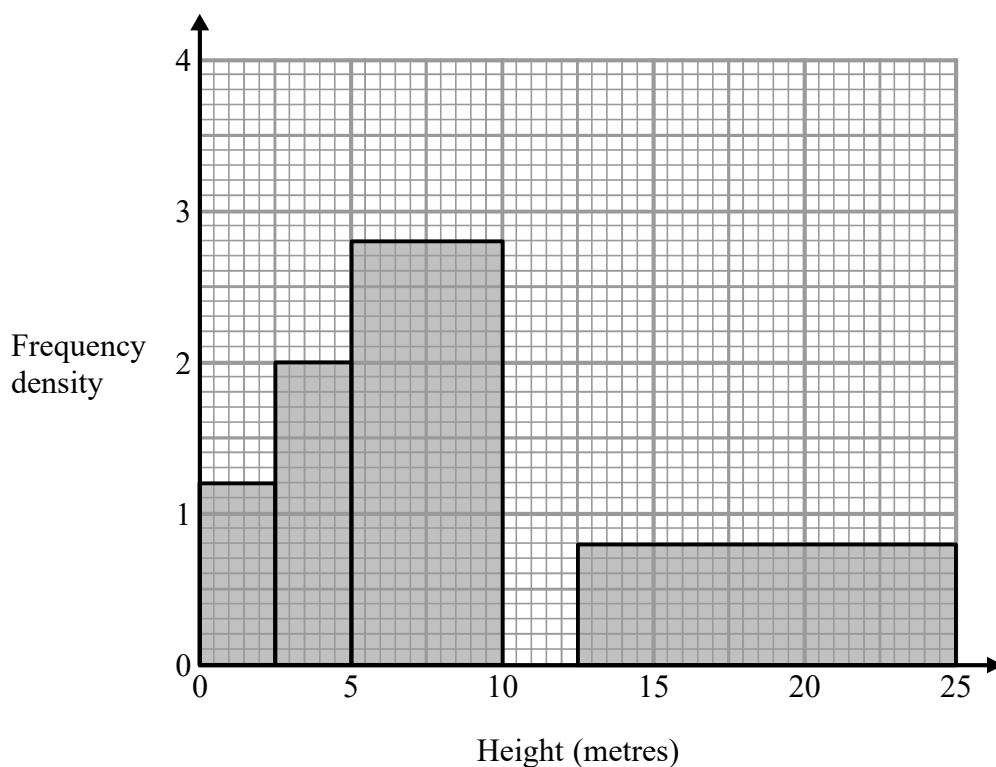
Angle *ODA* = 32°

Work out the size of angle *CAB*.
You must show all your working.

....°

(Total for Question 6 is 3 marks)

7 The histogram gives information about the heights, in metres, of the trees in a park.
The histogram is incomplete.

Height (metres)

20% of the trees in the park have a height between 10 metres and 12.5 metres.
None of the trees in the park have a height greater than 25 metres.

Complete the histogram.

(Total for Question 7 is 3 marks)

8 The number of slugs in a garden t days from now is p_t where

$$p_0 = 100$$

$$p_{t+1} = 1.06p_t$$

Work out the number of slugs in the garden 3 days from now.

....

(Total for Question 8 is 3 marks)

9 D is directly proportional to the cube of n.

Mary says that when n is doubled, the value of D is multiplied by 6

Mary is wrong.
Explain why.

....

....

....

(1)

(Total for Question 9 is 1 mark)