GCSE Grade 7

Maths Booklet 6

Paper 2H
Calculator

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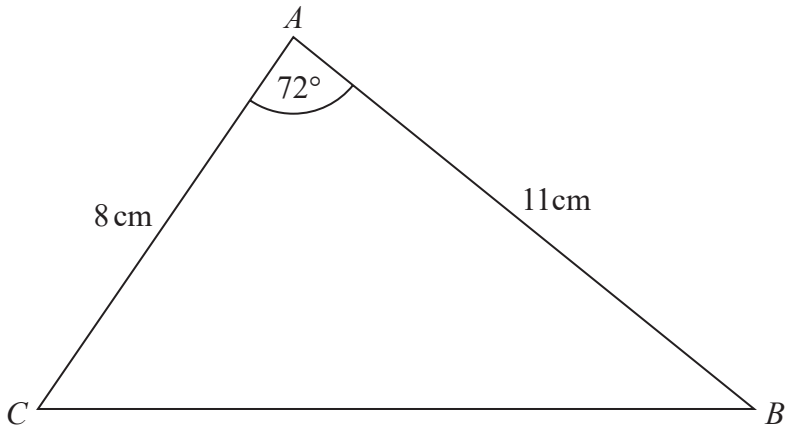
1 Here is triangle *ABC*.



(a) Find the length of *BC*.
Give your answer correct to 3 significant figures.

..... cm

(3)

(b) Find the area of triangle *ABC*.
Give your answer correct to 3 significant figures.

..... cm^2

(2)

(Total for Question 1 is 5 marks)

2 (a) Use the iteration formula $x_{n+1} = \sqrt[3]{10 - 2x_n}$ to find the values of x_1, x_2 and x_3
Start with $x_0 = 2$

$x_1 =$ .....

$x_2 =$ .....

$x_3 =$ .....

(3)

The values of x_1, x_2 and x_3 found in part (a) are estimates of the solution of an equation of the form $x^3 + ax + b = 0$ where a and b are integers.

(b) Find the value of a and the value of b.

$a =$ .....

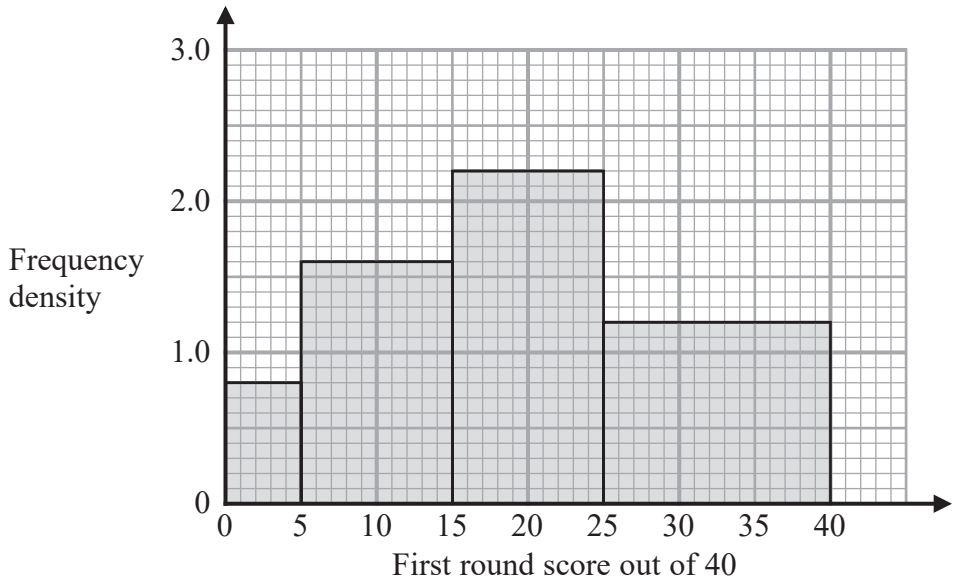
$b =$ .....

(1)

(Total for Question 2 is 4 marks)

3 Some people took part in the first round of a competition.

The histogram gives information about the scores of these people in the first round.



20% of the people got a score high enough for them to qualify for the second round.

Work out an estimate for the score needed to qualify for the second round.
You must show all your working.

.....

(Total for Question 3 is 4 marks)

4 The equation of a circle is $x^2 + y^2 = 42.25$

Find the radius of the circle.

.....

(Total for Question 4 is 1 mark)

5 There are only red counters and blue counters in a bag.

Joe takes at random a counter from the bag.
The probability that the counter is red is 0.65
Joe puts the counter back into the bag.

Mary takes at random a counter from the bag.
She puts the counter back into the bag.

(a) What is the probability that Joe and Mary take counters of different colours?

.....

(2)

There are 78 red counters in the bag.

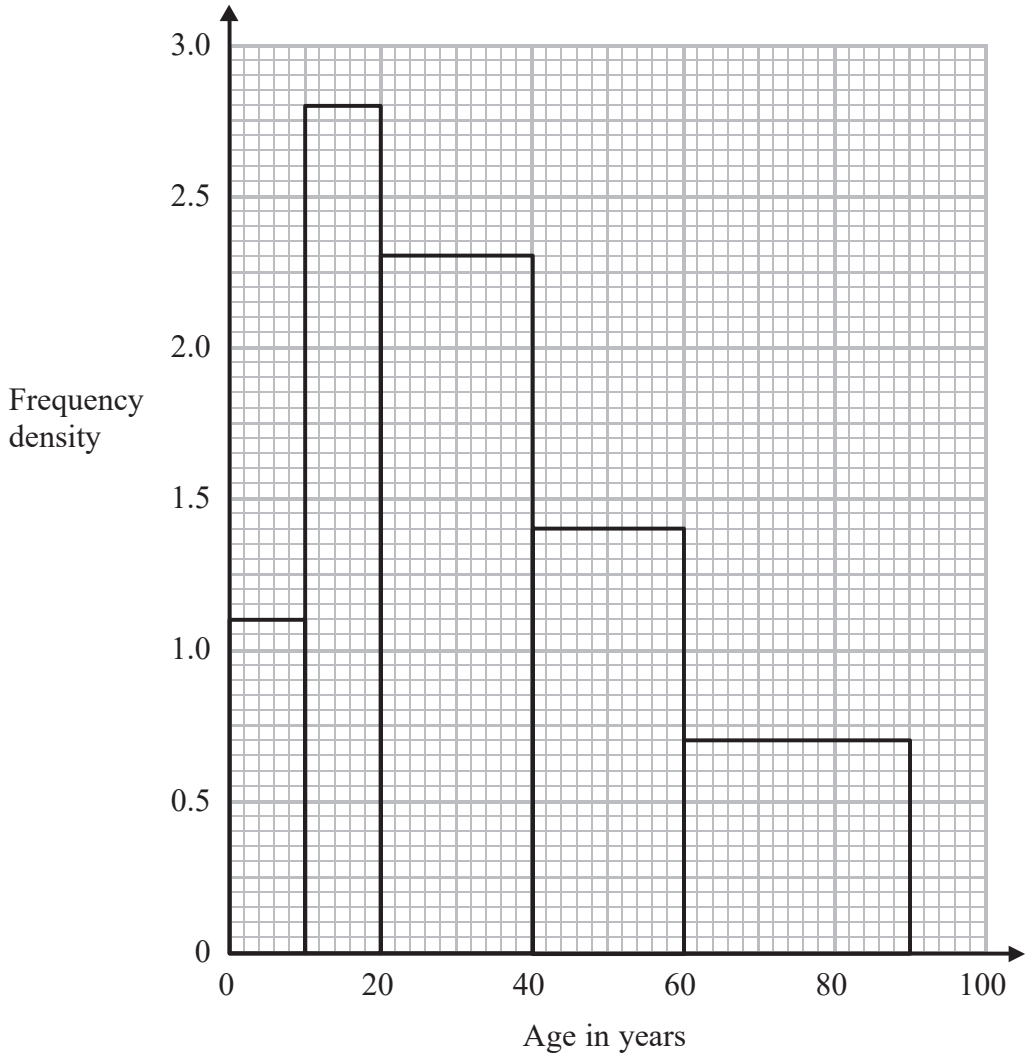
(b) How many blue counters are there in the bag?

.....

(2)

(Total for Question 5 is 4 marks)

6 The histogram shows some information about the ages of the 134 members of a sports club.



20% of the members of the sports club who are over 50 years of age are female.

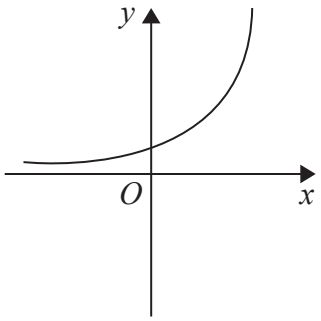
Work out an estimate for the number of female members who are over 50 years of age.

.....

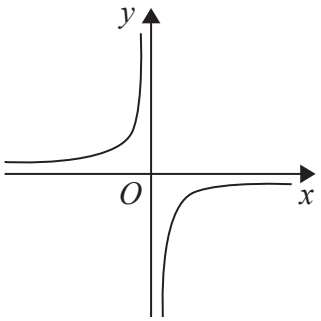
(Total for Question 6 is 3 marks)

7 Here are some graphs.

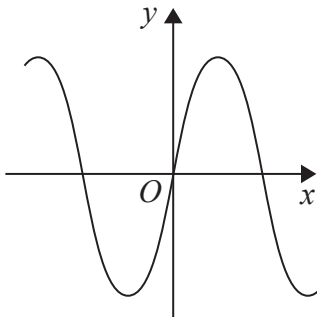
A



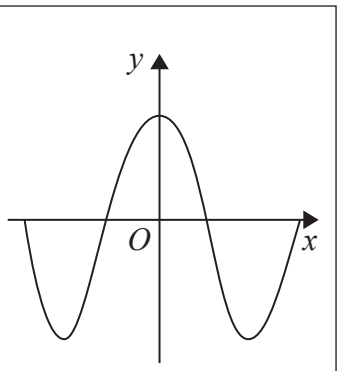
B



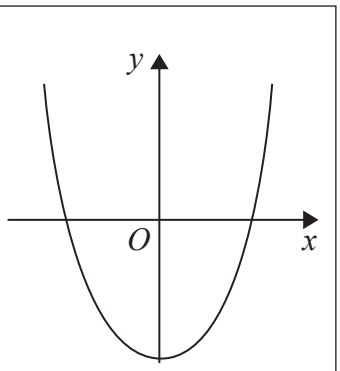
C



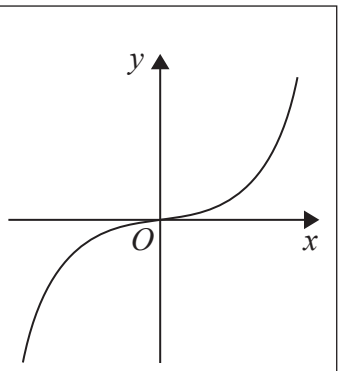
D



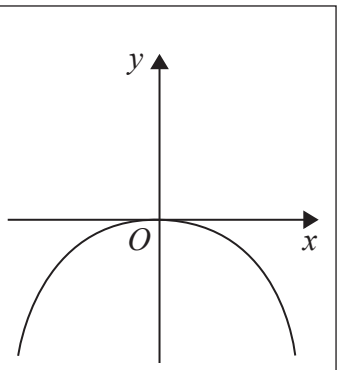
E



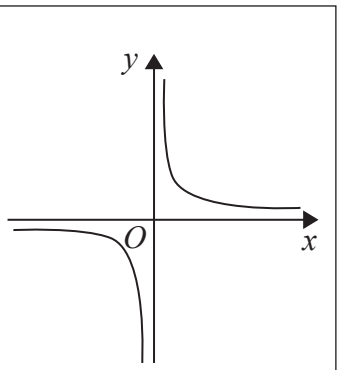
F



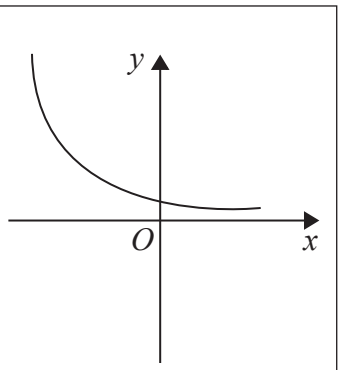
G



H



I

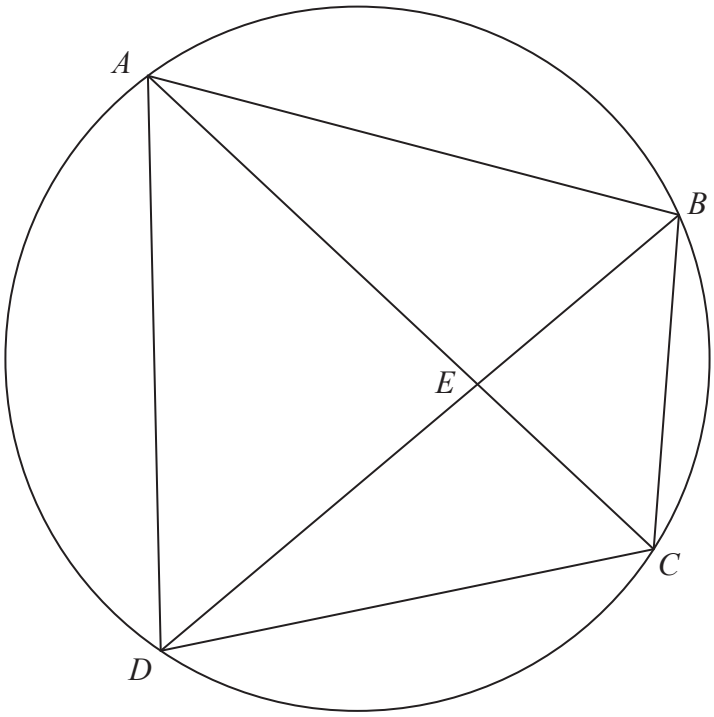


In the table below, match each equation with the letter of its graph.

Equation	Graph
$y = \sin x$	
$y = x^3 + 4x$	
$y = 2^x$	
$y = \frac{4}{x}$	

(Total for Question 7 is 3 marks)

8 A, B, C and D are four points on the circumference of a circle.



AEC and BED are straight lines.

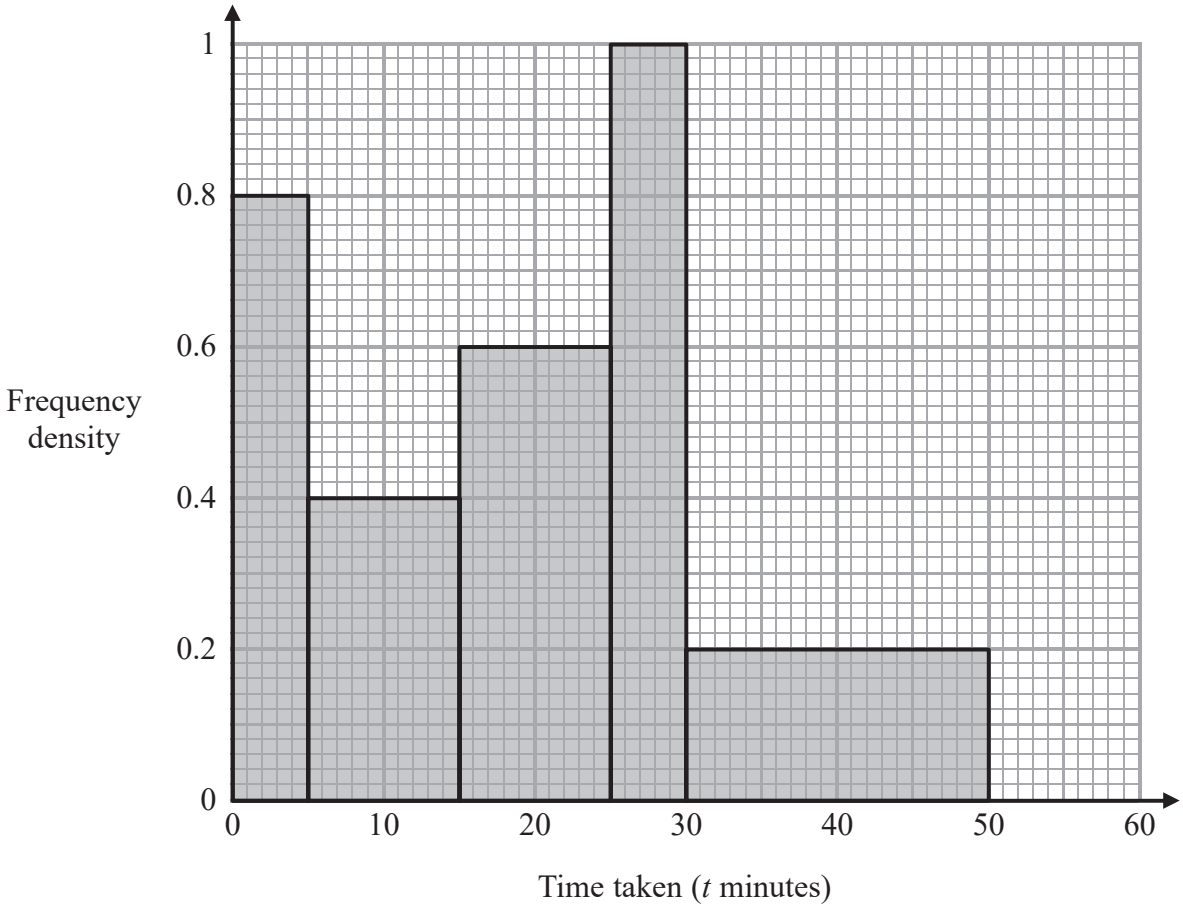
Prove that triangle ABE and triangle DCE are similar.
You must give reasons for each stage of your working.

(Total for Question 8 is 3 marks)

9 Using algebra, prove that $0.1\dot{3}\dot{6} \times 0.\dot{2}$ is equal in value to $\frac{1}{33}$

(Total for Question 9 is 3 marks)

10 The histogram shows information about the times taken by some students to finish a puzzle.



(a) Complete the frequency table for this information.

Time taken (t minutes)	Frequency
$0 < t \leqslant 5$	4
$5 < t \leqslant 15$	
$15 < t \leqslant 25$	
$25 < t \leqslant 30$	
$30 < t \leqslant 50$	

(2)

(b) Find an estimate for the lower quartile of the times taken to finish the puzzle.

..... minutes
(2)

(Total for Question 10 is 4 marks)