Mathematics

November 2018 Paper 3 (Calculator Allowed)
Part 1 (First half of the paper)
Edexcel Higher Tier

Time: 45 minutes

Q	Topic	Max Mark	My Marks
1	Use of a Calculator	3	
2	Percentage Change	3	
3	Drawing Quadratic Graphs	5	
4	Percentages, Estimate the Mean	6	
5	Compound Measures, Speed	4	
6	Ratio, Trigonometry (SOHCAHTOA)	4	
7	Frequency Polygons	2	
8	Volume and Surface Area	5	
9	Expanding Triple Brackets, Indices, Quadratic Formula	8	
	Total	40	

1   (a) Write 7357 correct to 3 significant figures.

....

(1)

(b) Work out $\dfrac{\sqrt{17} + 4^2}{7.3^2}$

Write down all the figures on your calculator display.

....

(2)

(Total for Question 1 is 3 marks)

2   Last year Jo paid £245 for her car insurance.
     This year she has to pay £883 for her car insurance.

     Work out the percentage increase in the cost of her car insurance.

.... %

(Total for Question 2 is 3 marks)

3 (a) Complete this table of values for $y = x^2 + x - 4$

x	-3	-2	-1	0	1	2	3
y		-2	-4		-2		

(2)

(b) On the grid, draw the graph of $y = x^2 + x - 4$ for values of x from -3 to 3
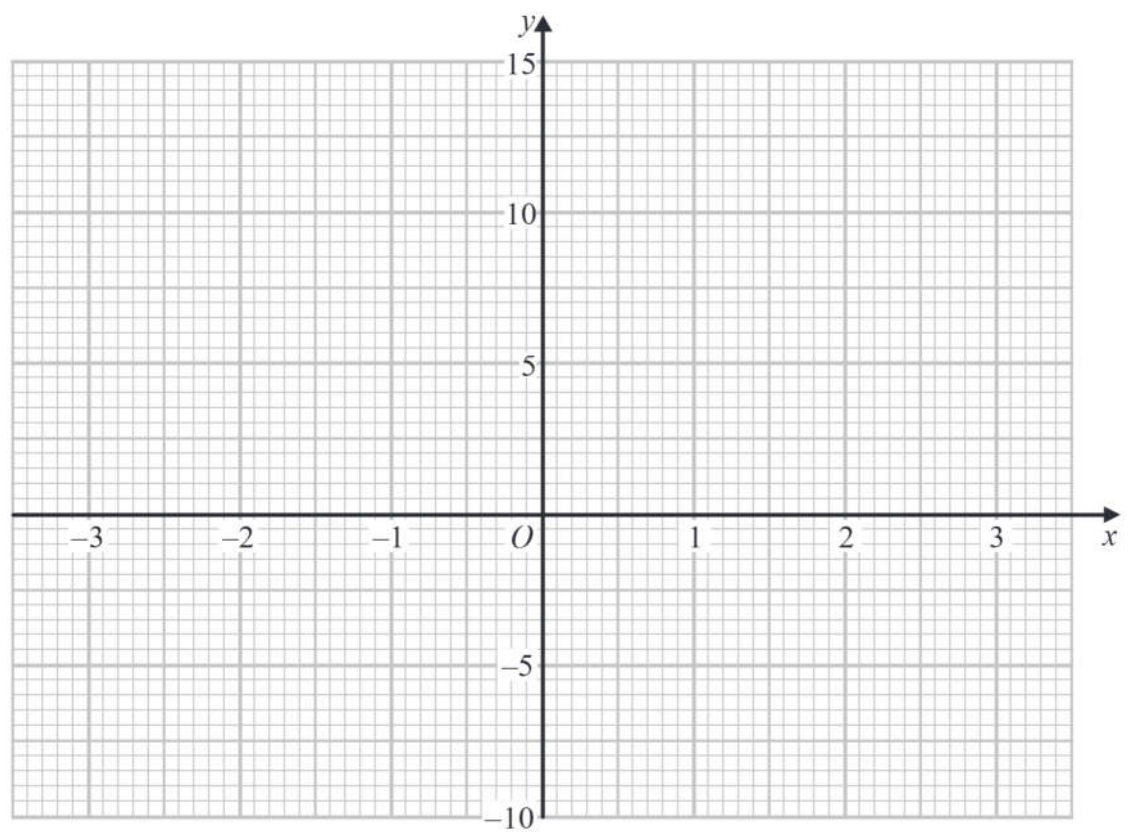
(2)

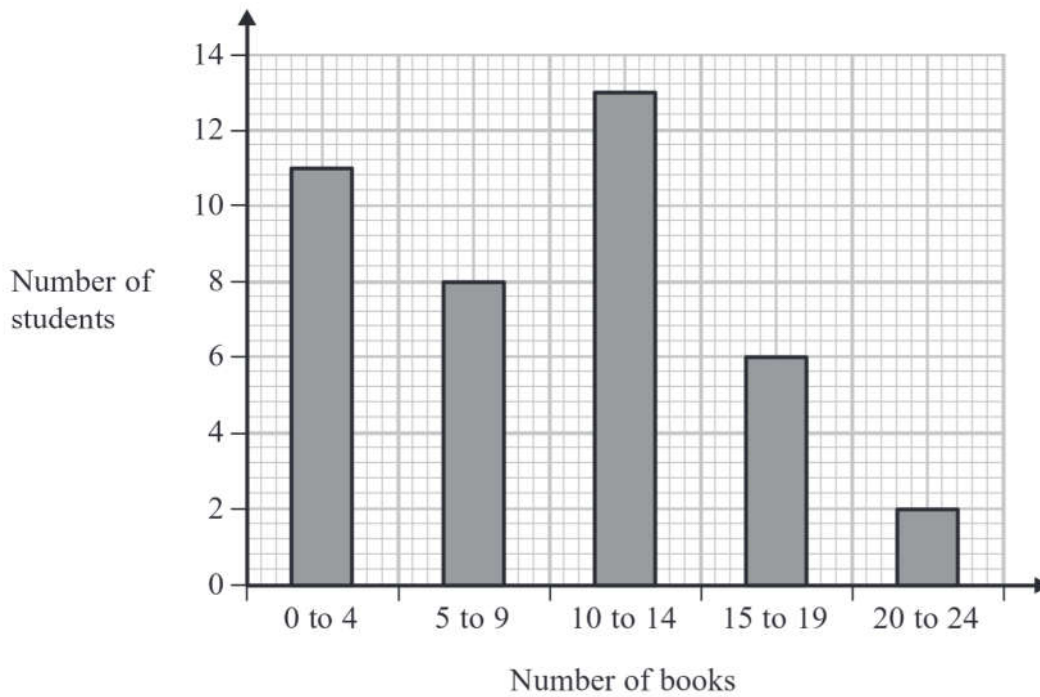(c) Use the graph to estimate a solution to $x^2 + x - 4 = 0$

....

(1)

(Total for Question 3 is 5 marks)

Turn over ▶

4 Fran asks each of 40 students how many books they bought last year.

The chart below shows information about the number of books bought by each of the 40 students.

(a) Work out the percentage of these students who bought 20 or more books.

....%

(2)

(b) Show that an estimate for the mean number of books bought is 9.5
You must show all your working.

(4)

(Total for Question 4 is 6 marks)

5 Lara is a skier.

She completed a ski race in 1 minute 54 seconds.
The race was 475 m in length.

Lara assumes that her average speed is the same for each race.

(a) Using this assumption, work out how long Lara should take to complete a 700 m race.
Give your answer in minutes and seconds.

.... minutes .... seconds

(3)

Lara's average speed actually increases the further she goes.

(b) How does this affect your answer to part (a)?

....

....

(1)

(Total for Question 5 is 4 marks)

6 *ABC* is a right-angled triangle.
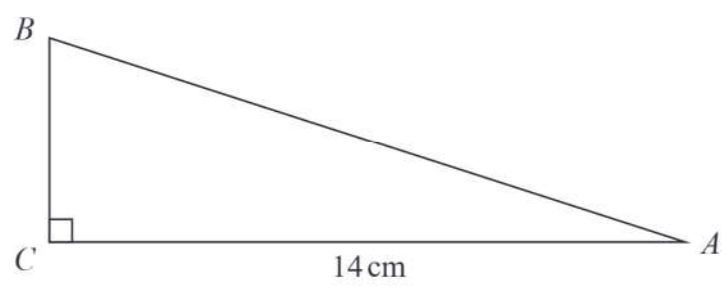
AC = 14 cm.
Angle *C* = 90°

      size of angle *B* : size of angle *A* = 3 : 2

Work out the length of *AB*.
Give your answer correct to 3 significant figures.

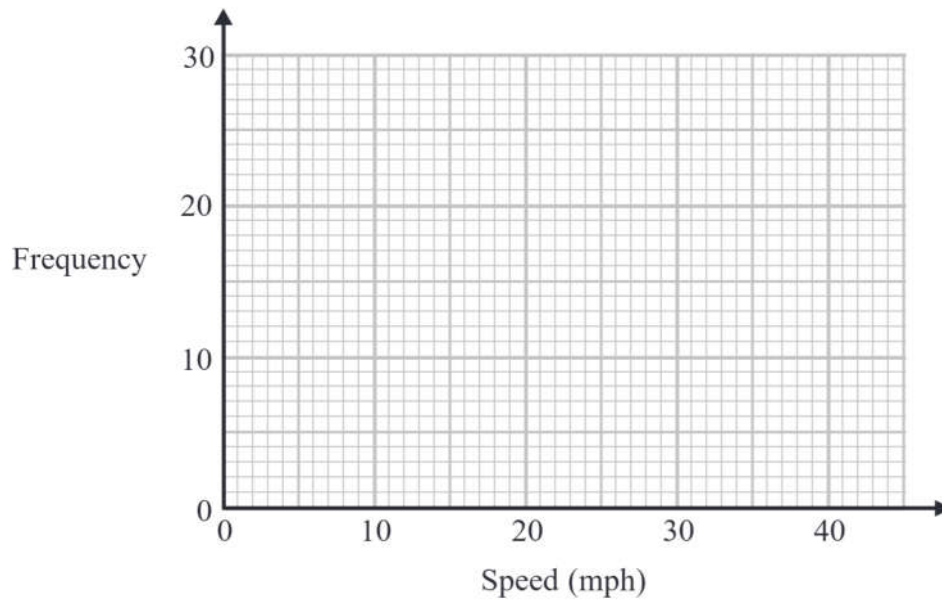..cm

(Total for Question 6 is 4 marks)

7 The table gives information about the speeds of 70 cars.

Speed (*s* mph)	Frequency
$0 < s \leqslant 10$	14
$10 < s \leqslant 20$	18
$20 < s \leqslant 30$	26
$30 < s \leqslant 40$	12

Draw a frequency polygon for this information.

Speed (mph)

(Total for Question 7 is 2 marks)

8 The diagram shows a solid metal cuboid.

The areas of three of the faces are marked on the diagram.
The lengths, in cm, of the edges of the cuboid are whole numbers.
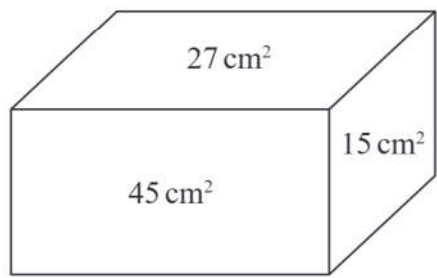
The metal cuboid is melted and made into cubes.
Each of the cubes has sides of length 2.5 cm.

Work out the greatest number of these cubes that can be made.

....

(Total for Question 8 is 5 marks)

9 (a) Expand and simplify $(x - 2)(2x + 3)(x + 1)$

....

(3)

$$\frac{y^4 \times y^n}{y^2} = y^{-3}$$

(b) Find the value of n.

....

(2)

(c) Solve $5x^2 - 4x - 3 = 0$

Give your solutions correct to 3 significant figures.

....

(3)

(Total for Question 9 is 8 marks)