

Name
Class

Predicted Paper 2

June 2014

Higher Tier

Edexcel Style

Calculator allowed

by

Jim King

Time 1 Hour 45 Minutes
Marks Available 100

The quality of written communication is specifically assessed. These questions are indicated by an asterisk (*)

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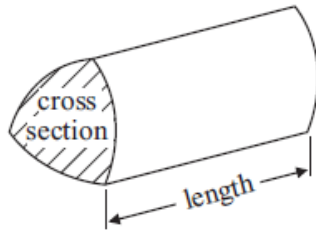
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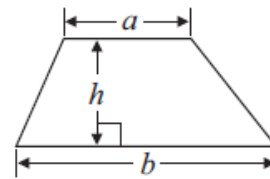
Formulae: Higher Tier

**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

Volume of prism = area of cross section \times length

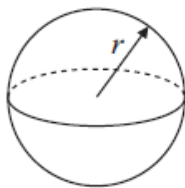


Area of trapezium = $\frac{1}{2} (a + b)h$



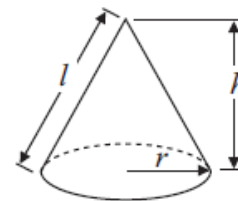
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

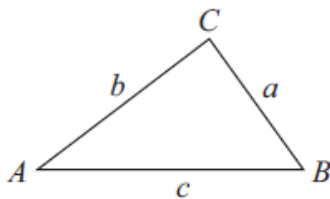


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle *ABC*



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2} ab \sin C$

Question 1

Mr Brown sows 200 flower seeds.

For each flower seed the probability that it will produce a flower is 0.8

Work out an estimate for the number of these flower seeds that will produce a flower.

.....

(2)

(Total 2 marks)

Question 2

(a) Use your calculator to work out the value of $\frac{45.6 \times 123}{0.34^2 - 0.28^2}$

Write down all the figures on your calculator display.

(2)

.....

(b) Write your answer to part (a) correct to 3 significant figures.

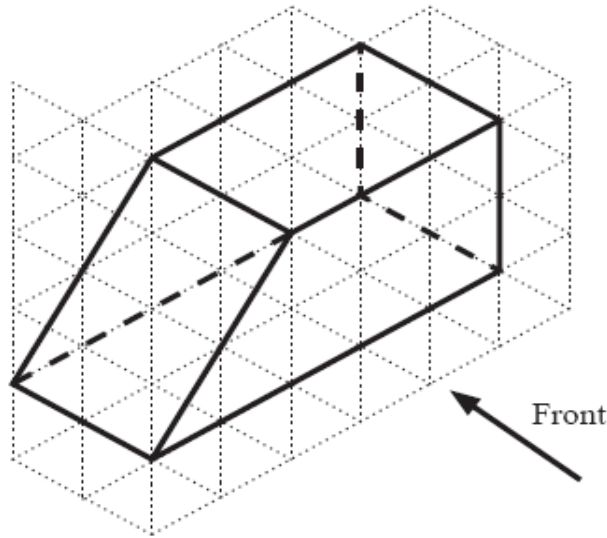
(1)

.....

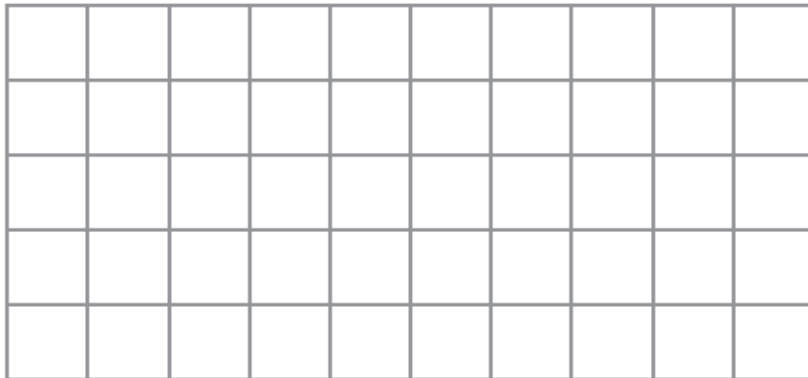
(Total 3 marks)

Question 3

The diagram shows a prism drawn on a centimetre isometric grid.

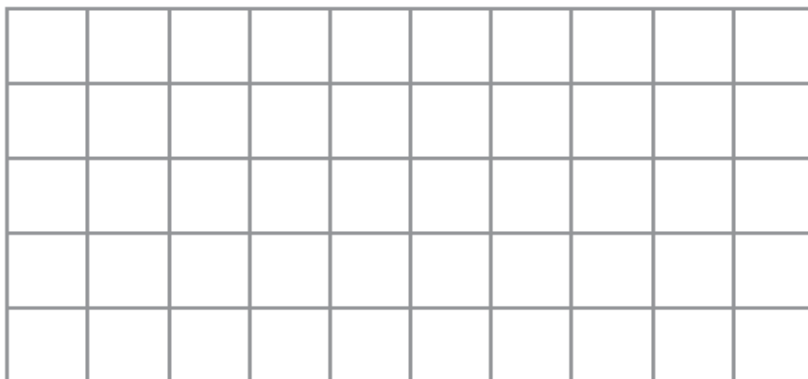


- (a) On the centimetre grid, draw the front elevation of the prism from the direction marked by the arrow.



(2)

- (b) On the centimetre grid draw a plan of the prism.

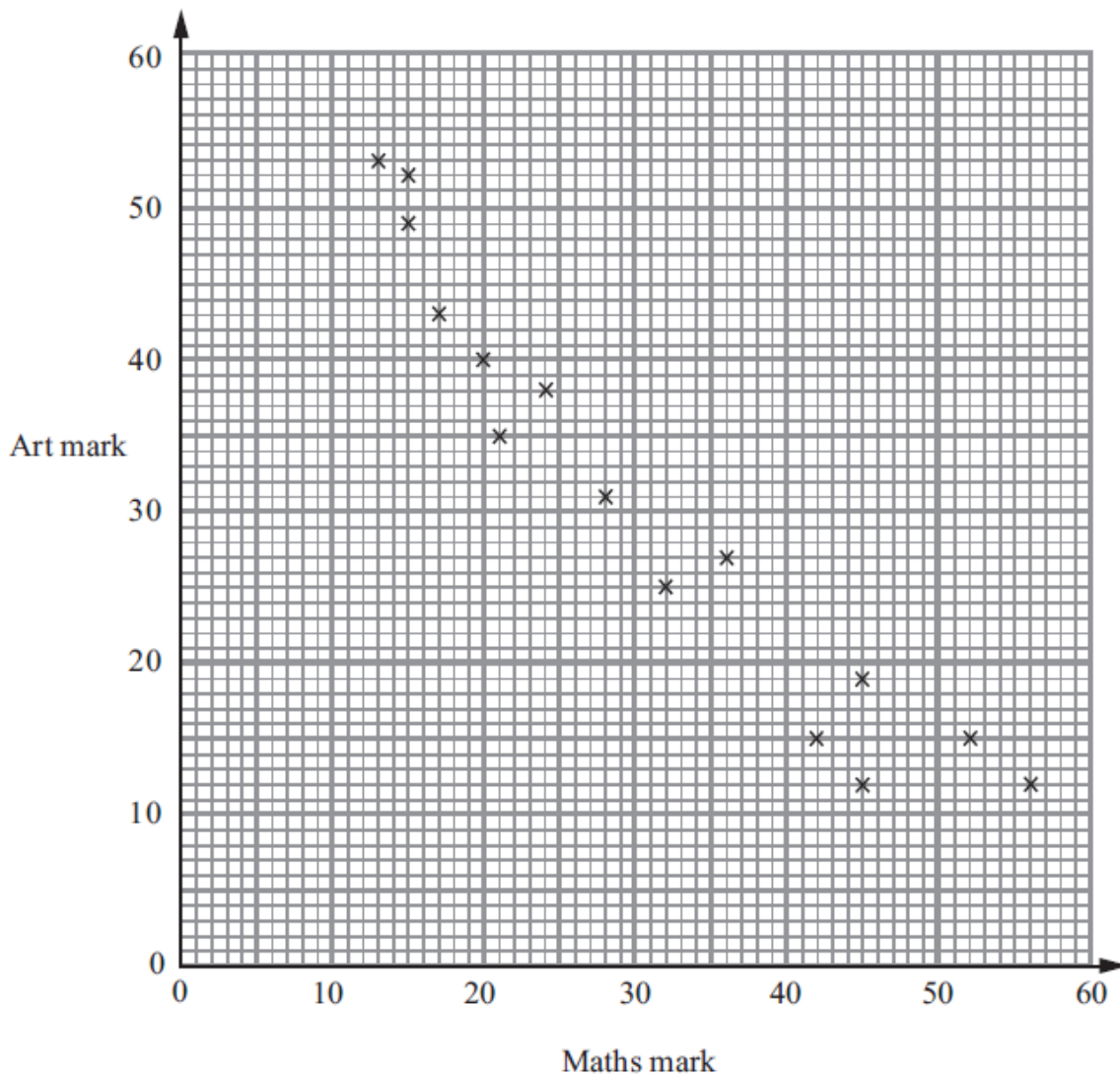


(2)

(Total 4 marks)

Question 4

The scatter graph shows the maths mark and the art mark for each of 15 students.



(a) What type of correlation does this scatter graph show?

(1)

.....

(b) Draw a line of best fit on the scatter graph.

(1)

Sarah has not got a maths mark.
Her art mark is 23

(c) Use your line of best fit to estimate a maths mark for Sarah.

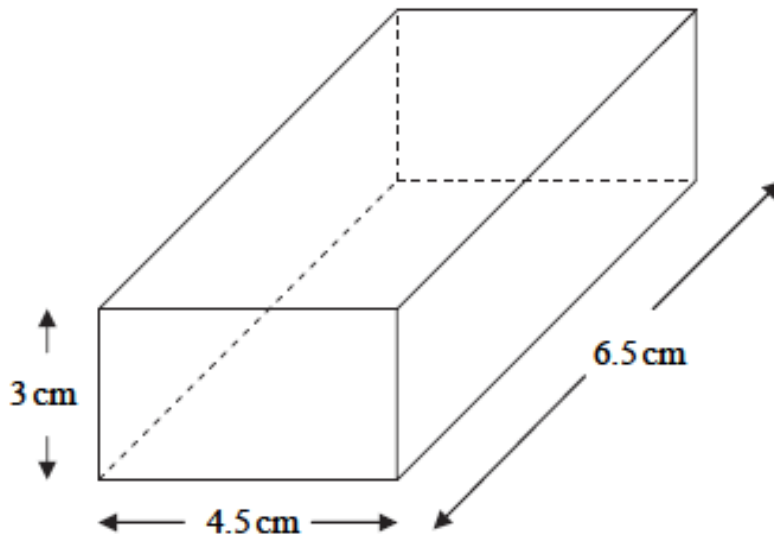
(1)

.....

(Total 3 marks)

Question 5

Here is a cuboid.



**Diagram NOT
accurately drawn**

Calculate the volume of the cuboid.

..... cm³

(Total 2 marks)

Question 6

Here are the first four terms of a number sequence.

2 7 12 17

(a) Work out the 10th term of this number sequence.

.....
(2)

Here are the first five terms of another number sequence.

-4 -1 2 5 8

(b) (i) Find, in terms of n , an expression for the n th term of this number sequence.

.....

(ii) Find **two** numbers that are in both number sequences.

.....
(3)

(Total 5 marks)

Question 7

Ron went to Spain.

He changed £200 into Euros (€).
The exchange rate was £1 = €1.40

(a) How many Euros did he get?

€
(2)

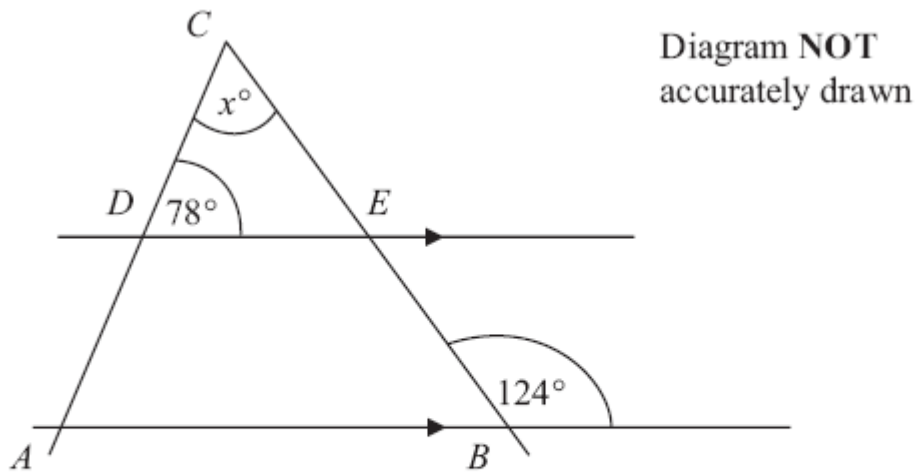
When he came home he changed €10.64 back into pounds.
The exchange rate was now £1 = € 1.33

(b) How many pounds did he get?

£
(2)

(Total 4 marks)

Question 8



ABC is a triangle.
DE is a straight line parallel to *AB*.

Work out the value of *x*.

.....
(2)

Give reasons for your answer.

.....
.....
(1)

(Total 3 marks)

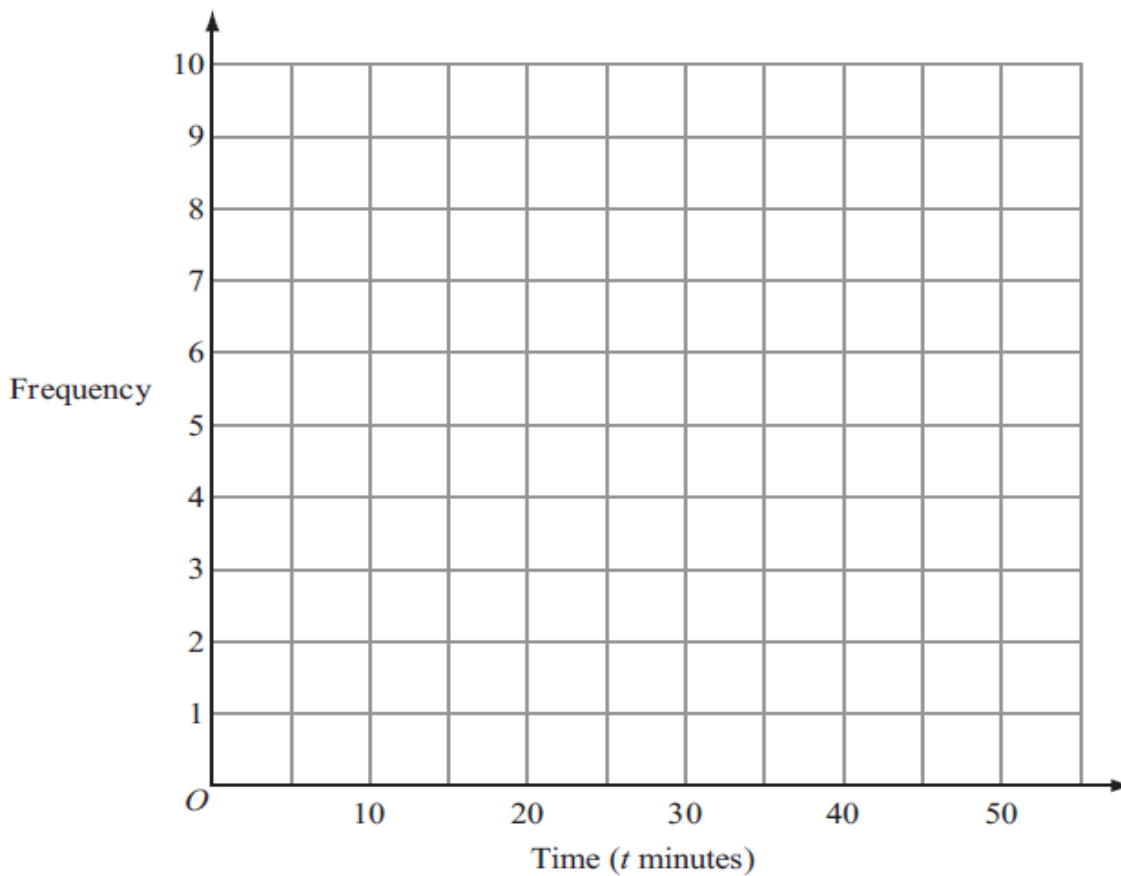
Question 9

30 students took a test.

The table shows information about how long it took them to complete the test.

Time (t minutes)	Frequency
$0 < t \leq 10$	5
$10 < t \leq 20$	7
$20 < t \leq 30$	8
$30 < t \leq 40$	6
$40 < t \leq 50$	4

On the grid, draw a frequency polygon for this information.



(2)

(Total 2 marks)

Question 10

(a) Write 126 as a product of its prime factors.

.....
(2)

(b) Find the Highest Common Factor (HCF) of 84 and 126

.....
(2)

(Total 4 marks)

Question 11

Last year Kerry's take home pay was £15 000
She spent 40% of her take home pay on rent.

She used the rest of her take home pay for living expenses, clothes and entertainment
in the ratio 3 : 1 : 2

How much did Kerry spend on entertainment last year?

£

(Total 4 marks)

Question 12

(a) $-3 \leq n < 2$

n is an integer.

Write down all the possible values of n .

.....
(2)

(b) Solve the inequality

$$5x < 2x - 6$$

.....
(2)

(Total 4 marks)

Question 13

The equation

$$x^3 + 4x^2 = 100$$

has a solution between 3 and 4

Use a trial and improvement method to find this solution.

Give your answer correct to one decimal place.

You must show **ALL** your working.

$$x = \dots\dots\dots$$

(4)

(Total 4 marks)

Question 14

In a sale, normal prices are reduced by 20%.
The sale price of a coat is £52

Work out the normal price of the coat.

£

(Total 3 marks)

Question 15

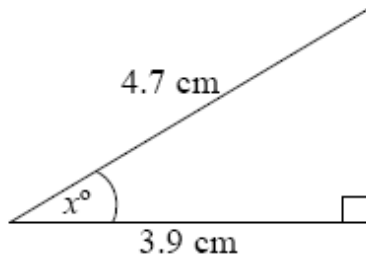


Diagram NOT
accurately drawn

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

$x =$

(Total 3 marks)

Question 16

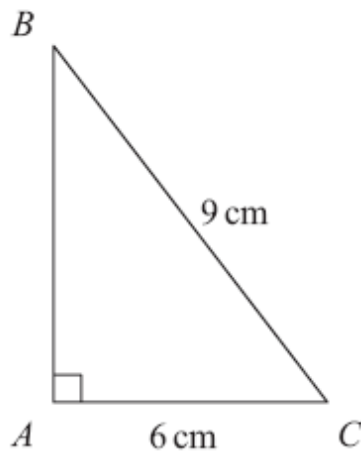


Diagram **NOT**
accurately drawn

ABC is a right-angled triangle.

$AC = 6$ cm.

$BC = 9$ cm.

Work out the length of AB .

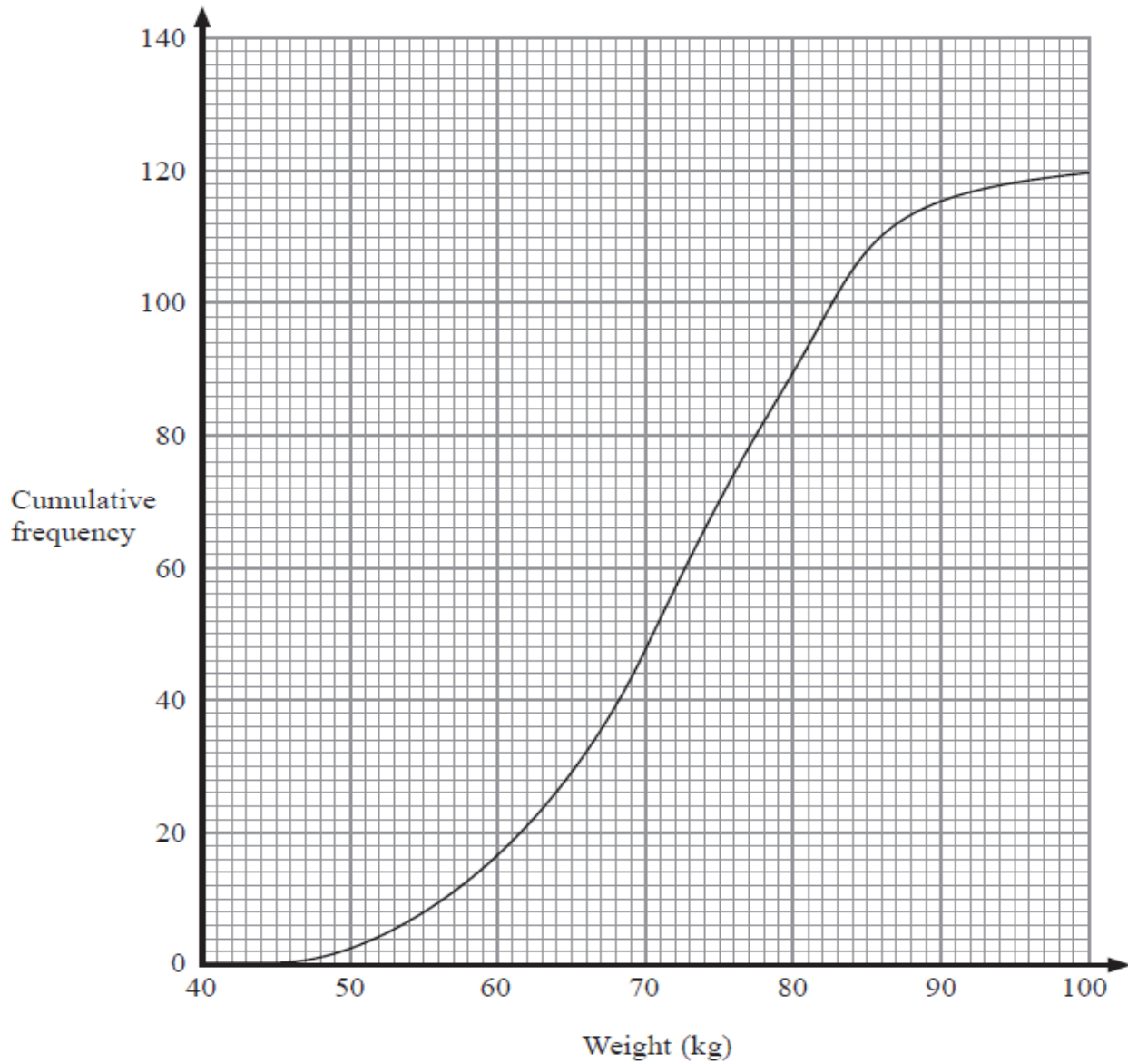
Give your answer correct to 3 significant figures.

..... cm

(Total 3 marks)

Question 17

Here is the cumulative frequency curve of the weights of 120 girls at Mayfield Secondary School.



Use the cumulative frequency curve to find an estimate for the

(i) median weight,

..... kg

(ii) interquartile range of the weights.

..... kg

(Total 3 marks)

Question 18

The table shows some information about the heights (h cm) of 100 students.

Height (h cm)	Frequency		
$120 \leq h < 130$	8		
$130 \leq h < 140$	16		
$140 \leq h < 150$	25		
$150 \leq h < 160$	30		
$160 \leq h < 170$	21		

(a) Find the class interval in which the median lies.

.....
(1)

(b) Work out an estimate for the mean height of the students.

..... cm
(4)

(Total 5 marks)

Question 19

f is inversely proportional to d .

When $d = 50$, $f = 256$

Find the value of f when $d = 80$

$f = \dots\dots\dots$

(Total 3 marks)

Question 20

Prove that the recurring decimal $0.\dot{4}\dot{5} = \frac{15}{33}$

(Total 3 marks)

Question 21

Solve $\frac{3}{x-2} + \frac{8}{x+3} = 2$

.....
(Total 5 marks)

Question 22

The length of a rectangle is 30 cm, correct to 2 significant figures.
The width of a rectangle is 18 cm, correct to 2 significant figures.

(a) Write down the upper bound of the width.

(1)

..... cm

(b) Calculate the upper bound for the area of the rectangle.

(2)

..... cm

(Total 3 marks)

Question 23

The table below gives some information about some students in a school.

Year group	Boys	Girls	Total
Year 12	126	94	220
Year 13	77	85	162
Total	203	179	382

Andrew is going to carry out a survey of these students.
He uses a sample of 50 students, stratified by year group and gender.

Work out the number of Year 13 girls that should be in his sample.

.....

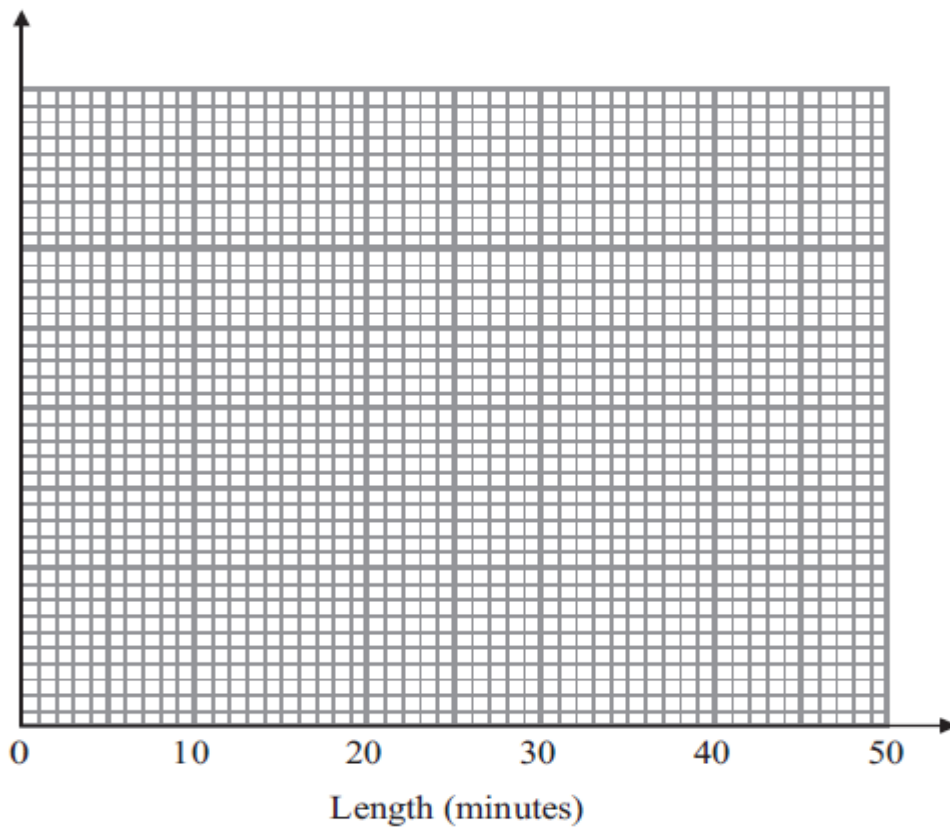
(Total 2 marks)

Question 24

A call centre receives 64 telephone calls one morning.
The table gives information about the lengths, in minutes, of these telephone calls.

Length (x) minutes	Frequency
$0 < x \leq 5$	4
$5 < x \leq 15$	10
$15 < x \leq 30$	24
$30 < x \leq 40$	20
$40 < x \leq 45$	6

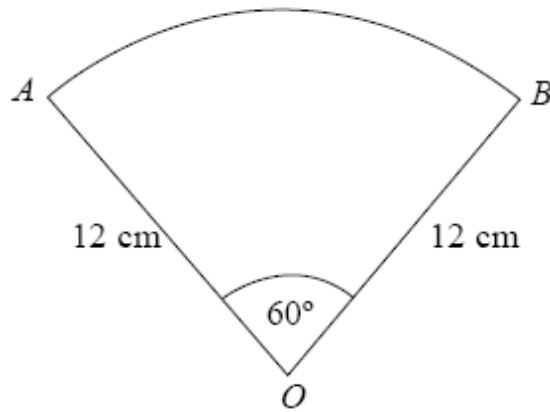
Draw a histogram for this information.



(Total 4 marks)

Question 25

Diagram NOT
accurately drawn



OAB is a sector of a circle, centre O .
Angle $AOB = 60^\circ$.
 $OA = OB = 12$ cm.

Work out the length of the arc AB .
Give your answer in terms of π .

..... cm

(Total 3 marks)

Question 26

The diagram below shows a 6-sided shape.

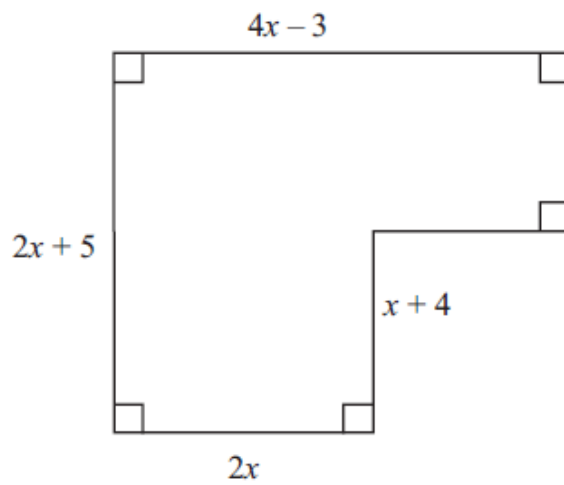


Diagram **NOT**
accurately drawn

All the measurements are in centimetres.

The area of this shape is 102 cm^2 .

Work out the length of the longest side of the shape.

..... cm
(Total 6 marks)

Question 27

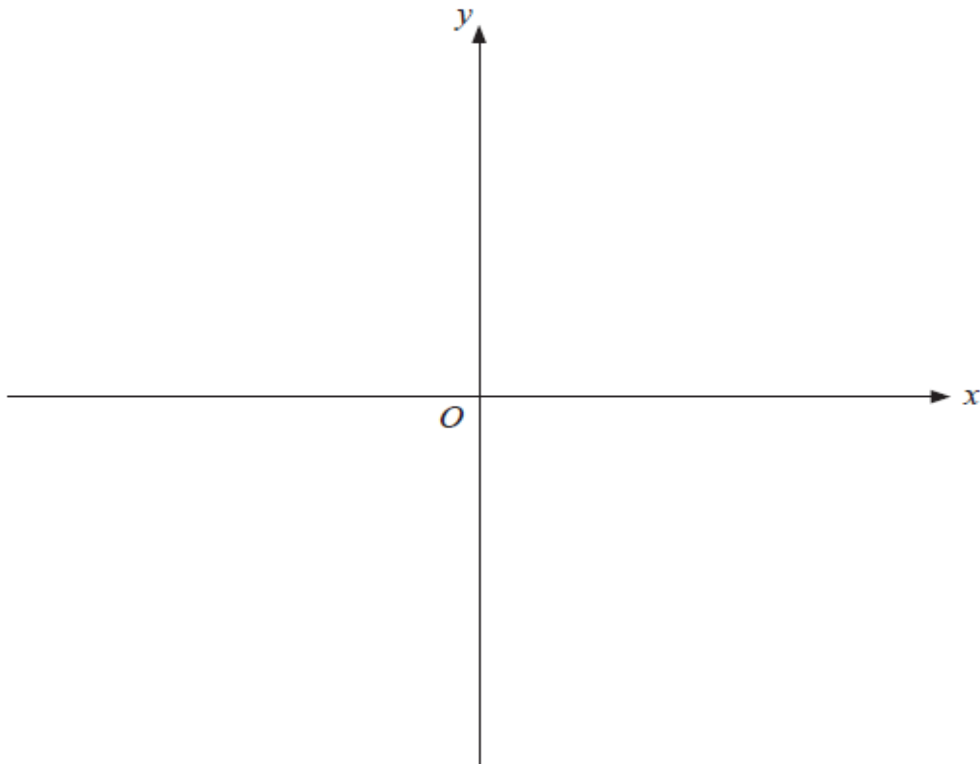
For all values of x ,

$$x^2 - 6x + 15 = (x - p)^2 + q$$

(a) Find the value of p and the value of q .

$p = \dots\dots\dots$, $q = \dots\dots\dots$
(2)

(b) On the axes, draw a sketch of the graph $y = x^2 - 6x + 15$



(2)

(Total 4 marks)

Question 28

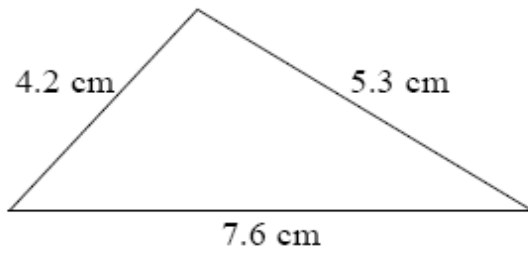


Diagram **NOT**
accurately drawn

The lengths of the sides of a triangle are 4.2 cm, 5.3 cm and 7.6 cm.

- (a) Calculate the size of the largest angle of the triangle.
Give your answer correct to 1 decimal place.

.....
(3)

- (b) Calculate the area of the triangle.
Give your answer correct to 3 significant figures.

..... cm²
(3)

(Total 6 marks)

END OF QUESTIONS