

1. A box contains 100 cards. Each card has a number between one and six written on it. The following table shows the frequencies for each number.

Number	1	2	3	4	5	6
Frequency	26	10	20	k	29	11

- (a) Calculate the value of k .

(2)

- (b) Find

- (i) the median;
(ii) the interquartile range.

(5)

(Total 7 marks)

2. A shop keeper recorded daily sales s of ice cream along with the daily maximum temperature $t^\circ\text{C}$. The results for one week are shown below.

t	29	31	34	23	19	20	27
s	104	92	112	48	56	72	66

- (a) Write down the equation of the regression line for s on t .

(3)

- (b) Use your equation to predict the ice cream sales on a day when the maximum temperature is 24°C . Give your answer correct to the nearest whole number.

(3)

(Total 6 marks)

3. In a geometric series, $u_1 = \frac{1}{81}$ and $u_4 = \frac{1}{3}$.

- (a) Find the value of r .

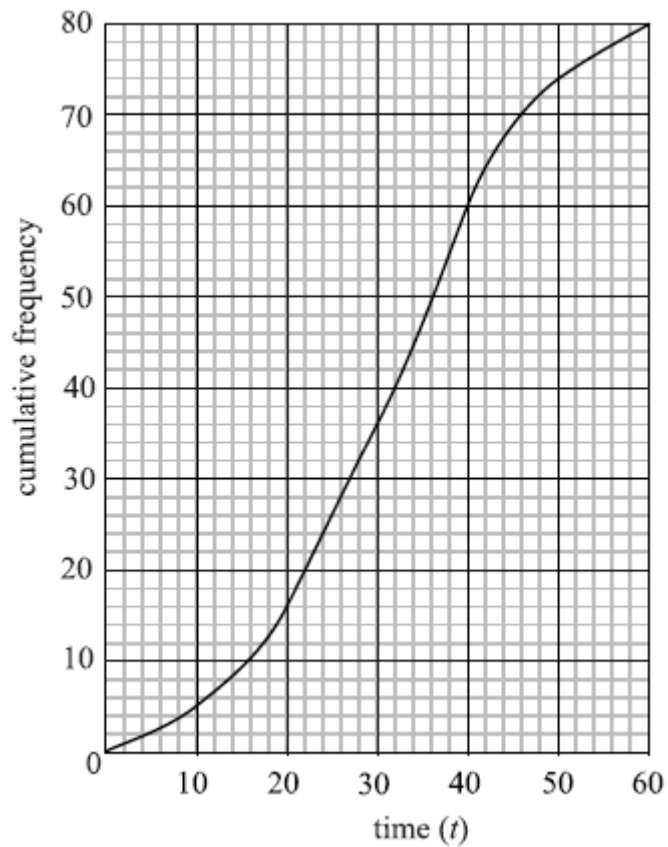
(3)

- (b) Find the smallest value of n for which $S_n > 40$.

(4)

(Total 7 marks)

4. The following is a cumulative frequency diagram for the time t , in minutes, taken by 80 students to complete a task.



- (a) Write down the median. (1)
- (b) Find the interquartile range. (3)
- (c) Complete the frequency table below.

Time (minutes)	Number of students
$0 \leq t < 10$	5
$10 \leq t < 20$	
$20 \leq t < 30$	20
$30 \leq t < 40$	24
$40 \leq t < 50$	
$50 \leq t < 60$	6

(2)
(Total 6 marks)

5. At the end of the year, only seven of the female Science students sat examinations in Science and French.

The marks for these seven students are shown in the following table.

Science (S)	23	51	56	62	12	73	72
French (F)	65	45	45	40	70	36	30

- (a) Using a scale of 2 cm to represent 10 marks for each axis, draw a labelled scatter diagram for this data. (4)

- (b) Use your graphic display calculator to find
- (i) \bar{S} , the mean of S ;
- (ii) \bar{F} , the mean of F . (2)

- (c) Plot the point $M(\bar{S}, \bar{F})$ on your scatter diagram. (1)

- (d) Use your graphic display calculator to find the equation of the regression line of F on S . (2)

- (e) Draw the regression line on your scatter diagram. (2)

Carletta's mark on the Science examination was 44. She did not sit the French examination.

- (f) Estimate Carletta's mark for the French examination. (2)

Monique's mark on the Science examination was 85. She did not sit the French examination. Her French teacher wants to use the regression line to estimate Monique's mark.

- (g) State whether the mark obtained from the regression line for Monique's French examination is reliable. Justify your answer. (2)

(Total 15 marks)

6. A path goes around a forest so that it forms the three sides of a triangle. The lengths of two sides are 550 m and 290 m. These two sides meet at an angle of 115° . A diagram is shown below.

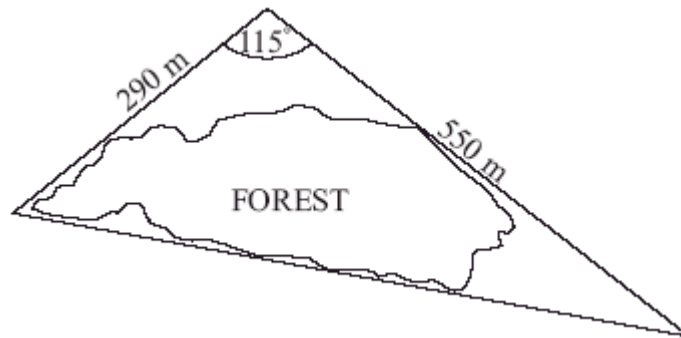


diagram not to scale

- (a) Calculate the length of the third side of the triangle. Give your answer correct to the nearest 10 m. (4)
- (b) Calculate the area enclosed by the path that goes around the forest. (3)

Inside the forest a second path forms the three sides of another triangle named ABC. Angle \hat{BAC} is 53° , AC is 180 m and BC is 230 m.



diagram not to scale

- (c) Calculate the size of angle \hat{ACB} . (4)
- (Total 11 marks)**