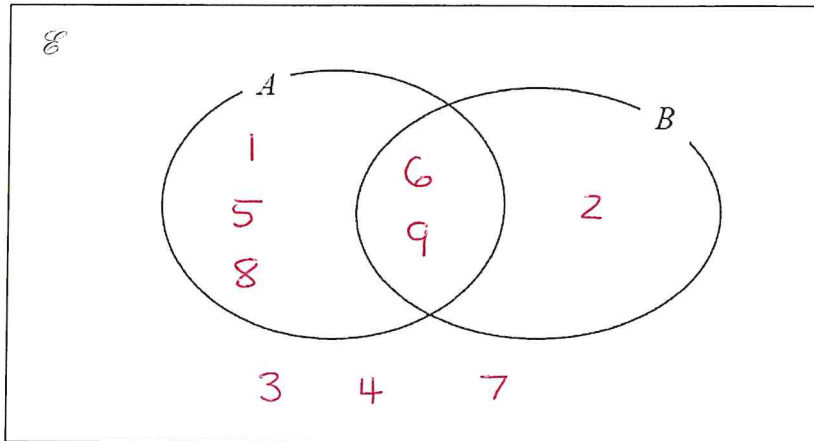


### Over-lap Questions June 2019 Paper 3

24/1  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$   
 $A = \{1, 5, 6, 8, 9\}$   
 $B = \{2, 6, 9\}$



(a) Complete the Venn diagram to represent this information.

(3)

A number is chosen at random from the universal set  $\mathcal{E}$ .

(b) Find the probability that the number is in the set  $A \cap B$

$\cap$   
 intersection  
 overlap

$$\frac{2}{9}$$

.....  
 (2)

25/2 Katy invests £200 000 in a savings account for 4 years.  
 The account pays compound interest at a rate of 1.5 % per annum.  
 Calculate the total amount of interest Katy will get at the end of 4 years.

$$200\,000 \times 1.015^4$$

$$= \pounds 212\,272.71$$

$$\text{Interest} = \pounds 12\,272.71$$

£.....12 272.71.....

(3)

26/3 The table shows information about the heights of 80 plants.

Height ( $h$ cm)	Frequency
$10 < h \leq 20$	7
$20 < h \leq 30$	13
$30 < h \leq 40$	14
$40 < h \leq 50$	12
$50 < h \leq 60$	16
$60 < h \leq 70$	18

Running Total

7

$7 + 13 = 20$

$20 + 14 = 34$

$34 + 12 = 46$

(a) Find the class interval that contains the median.

80

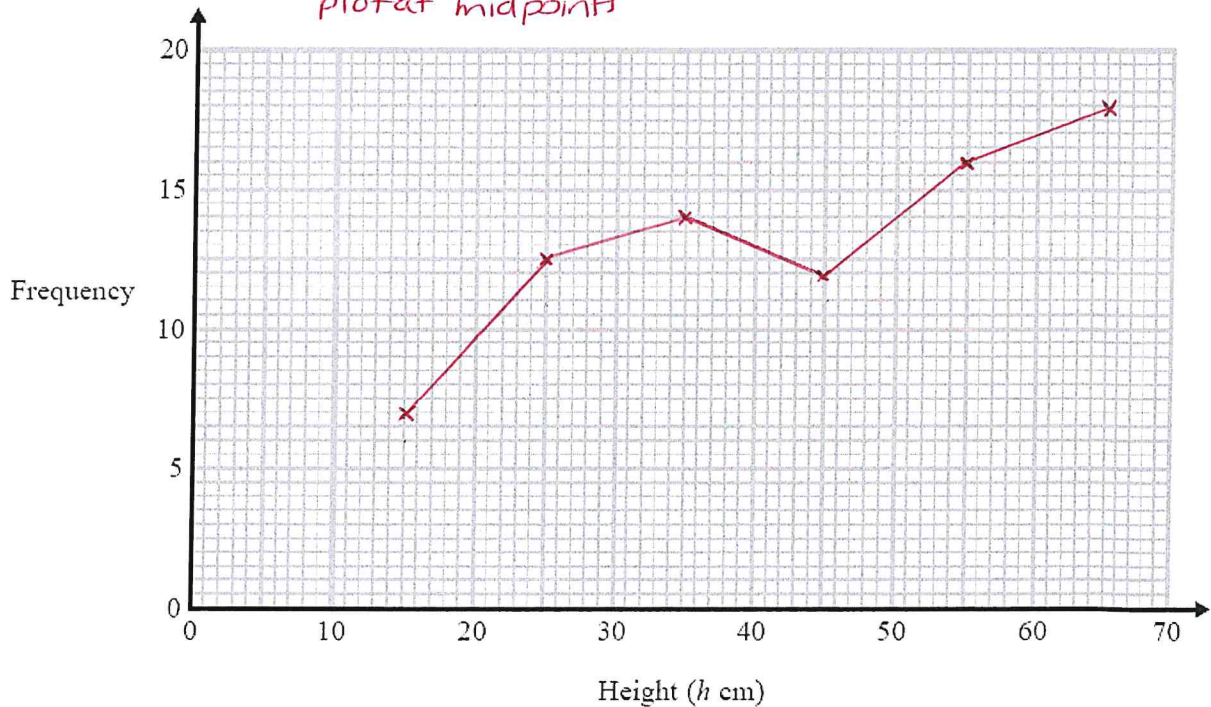
$\frac{1}{2}$  way

$40 < h \leq 50$

(1)

(b) On the grid, draw a frequency polygon for the information in the table.

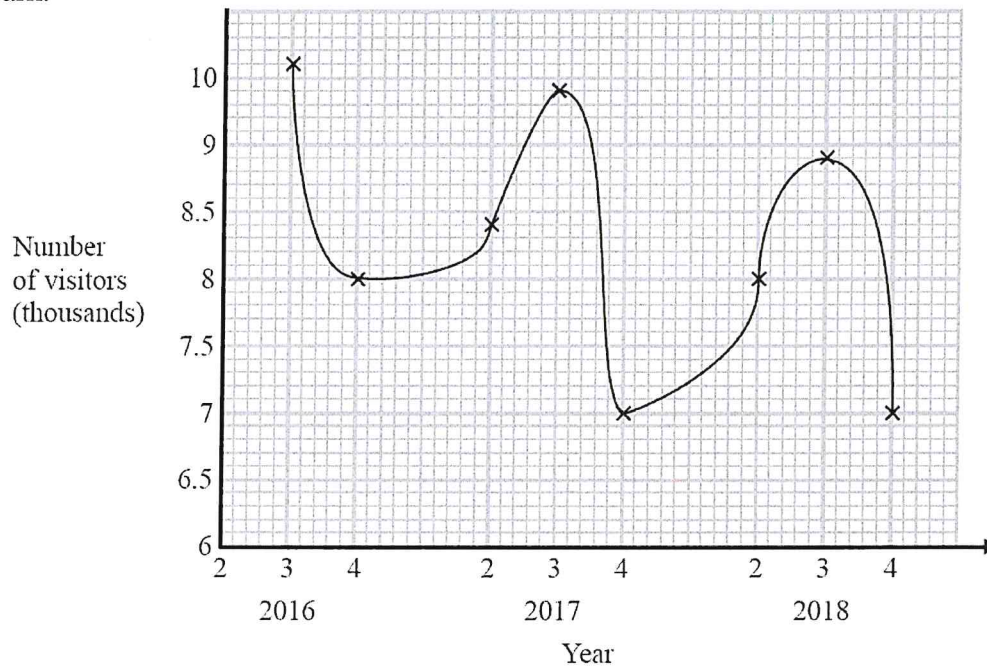
plot at midpoints



(2)

27/4

Sean has drawn a time series graph to show the numbers, in thousands, of visitors to a fun park.

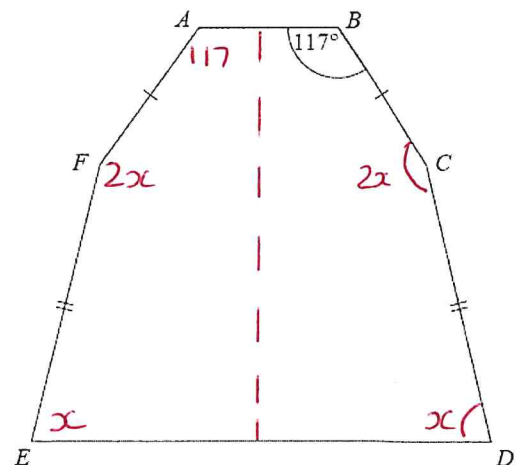


Write down two things that are wrong or could be misleading with this graph.

- 1 Part of x axis not labelled (1 missing)
  - 2 Line should be a straight line not curved
  - 3 On y axis 9.5 is missing
- (2)

28/5 The diagram shows a hexagon.  
The hexagon has one line of symmetry.

$FA = BC$   
 $EF = CD$   
 Angle  $ABC = 117^\circ$   
 Angle  $BCD = 2 \times$  angle  $CDE$   
 Work out the size of angle  $AFE$ .  
 You must show all your working.



$$\begin{aligned} \text{Angle sum hexagon} &= (n-2) \times 180 \\ &= 4 \times 180 \\ &= 720 \end{aligned}$$

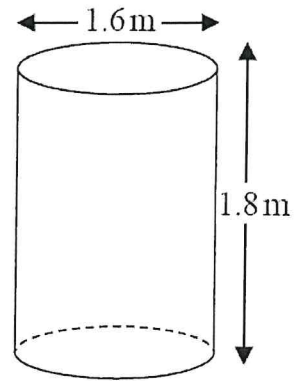
$$\begin{aligned} 6x + 117 + 117 &= 720 \\ 6x + 234 &= 720 \\ 6x &= 486 \end{aligned}$$

$$x = \frac{486}{6} = 81$$

$$2 \times 81 = 162$$

(4)

- 29/6 Jeremy has to cover 3 tanks completely with paint. Each tank is in the shape of a cylinder with a top and a bottom. The tank has a diameter of 1.6 m and a height of 1.8 m. Jeremy has 7 tins of paint. Each tin of paint covers  $5 \text{ m}^2$ . Has Jeremy got enough paint to cover completely the 3 tanks? You must show how you get your answer.



$$\begin{aligned}
 \text{Surface area} &= \pi d h + 2\pi r^2 \\
 &= \pi \times 1.6 \times 1.8 + 2 \times \pi \times 0.8^2 \\
 &= \frac{72\pi}{25} + \frac{32\pi}{25} \\
 &= \frac{104\pi}{25} \\
 &= 13.07 \text{ m}^2
 \end{aligned}$$

$$3 \text{ Tanks} = 3 \times 13.07 = \underline{39.21 \text{ m}^2}$$

$$7 \text{ tins} = 7 \times 5 = \underline{35 \text{ m}^2}$$

Jeremy does not have enough paint

(Total for Question 29/6 is 5 marks)

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TOTAL FOR PAPER IS 22 MARKS