



EXAM PAPERS PRACTICE

GCSE OCR Math J560
Mean, Median &
Mode

Answers

*"We will help you to
achieve A Star "*



Answer 1

Ed has 4 cards.
There is a number on each card.



The mean of the 4 numbers on Ed's cards is 10

Work out the number on the 4th card.

→ "AVERAGE"

$$\text{MEAN} = \frac{\text{TOTAL OF NUMBERS}}{\text{NUMBER OF CARDS}}$$

$$10 = \frac{12 + 6 + 15 + x}{4}$$

$$4 \times 10 = \frac{33 + x}{4} \times 4$$

400F

$$40 = 33 + x$$
$$\begin{array}{r} -33 \\ -33 \end{array}$$

$$\underline{\underline{7 = x}}$$



Answer 2

The table gives information about the heights of 50 trees.

<u>MIVS</u>	Height (h metres)	Frequency
2	$0 < h \leq 4$	8
6	$4 < h \leq 8$	21
10	$8 < h \leq 12$	12
14	$12 < h \leq 16$	7
18	$16 < h \leq 20$	2

Work out an estimate for the mean height of the trees.

↓
USE MID INTERVAL VALUES

$$\begin{aligned} \text{MEAN} &= \frac{\text{TOTAL HEIGHT}}{\text{NO OF TREES}} \\ &= \frac{2 \times 8 + 6 \times 21 + 10 \times 12 + 14 \times 7 + 18 \times 2}{50} \\ &= \underline{\underline{7.92 \text{ m}}} \end{aligned}$$



Answer 3

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

$$\text{MEAN} = \frac{\text{TOTAL HEIGHT}}{\text{NO OF GIRLS}}$$

USE MID INTERVAL
VALUES

$$\begin{aligned}\text{MEAN} &= \frac{11 \times 1.35 + 9 \times 1.45 + 7 \times 1.55 + 6 \times 1.65 + 2 \times 1.75}{35} \\ &= \frac{52.15}{35} \\ &= \underline{\underline{1.49}}\end{aligned}$$



Answer 4

3 of the 25 women have a shoe size of 7

Zoe says that if you choose at random one of the 25 women, the probability that she has either a shoe size of 7 or a dress size of 14 is $\frac{9}{25}$ because

$$\frac{3}{25} + \frac{6}{25} = \frac{9}{25}$$

(b) Is Zoe correct?

You must give a reason for your answer.

NO, BECAUSE SOMEBODY MAY BE
IN BOTH CATEGORIES
(- MUST BE MUTUALLY EXCLUSIVE
EVENTS TO ADD PROBABILITIES)

Answer 5

Nadiya says,

“The mean may **not** be the best average to use to represent this information.”

(b) Do you agree with Nadiya?

You must justify your answer.

OUTLIERS AFFECT THE MEAN, SO
THE MEDIAN MIGHT BE BETTER



Answer 6

(b) Calculate an estimate for the mean foot length.

$$\rightarrow \text{MEAN} = \frac{\text{TOTAL LENGTH}}{\text{NO OF ADULTS}}$$

USE MID INTERVAL VALUES.

$$\begin{aligned} \text{MEAN} &\approx \frac{3 \times 17 + 6 \times 19 + 10 \times 21 + 12 \times 23 + 9 \times 25}{40} \\ &\approx \underline{\underline{21.9 \text{ cm}}} \end{aligned}$$



Answer 7

Jenny works in a shop that sells belts.

The table shows information about the waist sizes of 50 customers who bought belts from the shop in May.

Belt size	Waist (w inches)	Frequency	MIVs
Small	$28 < w \leq 32$	24	30
Medium	$32 < w \leq 36$	12	34
Large	$36 < w \leq 40$	8	38
Extra Large	$40 < w \leq 44$	6	42

(a) Calculate an estimate for the mean waist size.

USE MID INTERVAL VALUES

$$\begin{aligned} \text{MEAN} &= \frac{\text{TOTAL WAISTES}}{\text{NO OF CUSTOMERS}} \\ &= \frac{24 \times 30 + 12 \times 34 + 8 \times 38 + 6 \times 42}{50} \\ &= 33.68 \text{ INCHES} \\ &= \underline{\underline{34 \text{ INCHES}}} \end{aligned}$$



Answer 8

Bob asked each of 40 friends how many minutes they took to get to work.

"MID INTERVAL
VALUES"

The table shows some information about his results.

Time taken (m minutes)	Frequency	MIV	TOTAL
$0 < m \leq 10$	3	5	15
$10 < m \leq 20$	8	15	120
$20 < m \leq 30$	11	25	275
$30 < m \leq 40$	9	35	315
$40 < m \leq 50$	9	45	405

Work out an estimate for the mean time taken

40 1130

$$\text{MEAN TIME} = \frac{\text{TOTAL TIME}}{\text{TOTAL FREQUENCY}}$$

$$\begin{aligned} \text{MEAN TIME} &\approx \frac{1130}{40} \\ &\approx 28.25 \text{ minutes} \end{aligned}$$



Answer 9

Sumeet records the times, in minutes, for 40 runners to finish a half marathon.

Information about these times is shown in the table.

<u>MIVs</u>	Time (t minutes)	Frequency
75	$60 < t \leq 90$	10
105	$90 < t \leq 120$	14
135	$120 < t \leq 150$	9
165	$150 < t \leq 180$	5
195	$180 < t \leq 210$	2

Calculate an estimate for the mean time.

USE MID INTERVALS VALUES

$$\text{MEAN} = \frac{\text{TOTAL TIME}}{\text{NO OF RUNNERS}}$$

$$= \frac{75 \times 10 + 105 \times 14 + 135 \times 9 + 165 \times 5 + 195 \times 2}{40}$$

$$= \underline{\underline{116.25 \text{ minutes}}}$$



Answer 10

The table gives information about the heights of 35 girls.

MIVs	Height (h metres)	Frequency
<u>1.35</u>	$1.30 \leq h < 1.40$	11
<u>1.45</u>	$1.40 \leq h < 1.50$	9
<u>1.55</u>	$1.50 \leq h < 1.60$	7
<u>1.65</u>	$1.60 \leq h < 1.70$	6
<u>1.75</u>	$1.70 \leq h < 1.80$	2

(a) Find the class interval that contains the median. \rightarrow MIDDLE GIRL

MEDIAN IS THE $\left(\frac{35+1}{2}\right)^{TH}$ IE 18TH GIRL

SHE IS IN $1.40 \leq h < 1.50$



Answer 11

The table shows some information about the dress sizes of 25 women.

Dress size	Number of women
8	2
10	9
12	8
14	6

2 + 9 = 11

(a) Find the median dress size.

↳ MIDDLE WOMAN IS 13TH WOMAN

11 WOMEN IN 8 AND 10 CATEGORIES

SO MEDIAN DRESS SIZE IS 12.



Answer 12

There are 18 packets of sweets and 12 boxes of sweets in a carton.

The mean number of sweets in all the 30 packets and boxes is 14

The mean number of sweets in the 18 packets is 10

Work out the mean number of sweets in the boxes.

$$\text{MEAN} = \frac{\text{TOTAL SWEETS}}{\text{NO OF CONTAINERS}}$$

CARTON

$$\text{MEAN}_c = \frac{\text{TOTAL}_c}{\text{NO OF CONTAINERS}}$$

$$30 \times 14 = \frac{\text{TOTAL}_c}{30} \times 30$$

$$\begin{array}{r} 14 \\ \times 3 \\ \hline 42 \end{array}$$

$$\text{TOTAL}_c = \underline{\underline{420}}$$

PACKETS

$$\text{MEAN}_p = \frac{\text{TOTAL}_p}{\text{NO OF P.}}$$

$$18 \times 10 = \frac{\text{TOTAL}_p}{18} \times 18$$

$$\text{TOTAL}_p = \underline{\underline{180}}$$

BOXES

$$\text{MEAN}_b = \frac{\text{TOTAL}_b}{\text{NO OF B}}$$

$$\text{MEAN}_b = \frac{420 - 180}{12}$$

$$= \frac{240}{12}$$

$$= \underline{\underline{20}}$$



Answer 13

There are 10 boys and 20 girls in a class.
The class has a test.

The mean mark for all the class is 60
The mean mark for the girls is 54

Work out the mean mark for the boys.

$$\text{MEAN} = \frac{\text{TOTAL MARKS}}{\text{NO OF PUPILS}}$$

$$\text{CLASS: } 30 \times 60 = \frac{\text{TOTAL}}{30} \times 30$$

$$\text{TOTAL} = \underline{1800}$$

$$\text{GIRLS: } 20 \times 54 = \frac{\text{TOTAL}}{20} \times 20$$

$$\text{TOTAL} = \underline{1080}$$

$$(20 \times 54 = 1080)$$

$$\text{BOYS: MEAN} = \frac{1800 - 1080}{10}$$

$$= \frac{720}{10}$$

$$= \underline{72}$$



Answer 14

Mr Brown gives his class a test.
The 10 girls in the class get a mean mark of 70%
The 15 boys in the class get a mean mark of 80%

Nick says that because the mean of 70 and 80 is 75 then the mean mark for the whole class in the test is 75%

Nick is not correct.
Is the correct mean mark less than or greater than 75%?
You must justify your answer.

$$\text{MEAN} = \frac{\text{TOTAL PERCENTAGE}}{\text{NO. OF PUPILS}}$$

$$\text{GIRLS: } 10 \times 70 = \frac{\text{TOTAL}}{10} \times 10$$

$$\text{TOTAL} = \underline{700}$$

$$\text{BOYS: } 15 \times 80 = \frac{\text{TOTAL}}{15} \times 15$$

$$\text{TOTAL} = \underline{1200}$$

$$\begin{array}{r} 10 \times 80 = 800 \\ 5 \times 80 = 400 \\ \hline 15 \times 80 = 1200 \end{array}$$

$$\text{CLASS: } \text{MEAN} = \frac{700 + 1200}{10 + 15}$$

$$= \frac{1900}{25}$$

$$= \frac{1900}{100} \times 4$$

$$= 19 \times 4$$

$$= \underline{\underline{76}}$$

$$\text{MEAN MEAN} > \underline{\underline{75\%}}$$

" $\div 25$ " IS SAME
AS " $\div 100, \times 4$ "



Answer 15

Hertford Juniors is a basketball team.

At the end of 10 games, their mean score is 35 points per game.

At the end of 11 games, their mean score has gone down to 33 points per game.

How many points did the team score in the 11th game? = x

$$\text{MEAN SCORE} = \frac{\text{TOTAL POINTS}}{\text{NUMBER OF GAMES}}$$

109. $10 \times 35 = \frac{TP}{10} \times 10$

$$\underline{350 = TP}$$

119. $11 \times 33 = \frac{350 + x}{11} \times 11$

$$\begin{array}{r} 363 = 350 + x \\ -350 \quad -350 \end{array}$$

$$\underline{\underline{13 = x}}$$

$$\begin{array}{r} 10 \times 33 = 330 \\ 1 \times 33 = 33 \\ \hline 11 \times 33 = 363 \end{array}$$