

P17 - Averages and Range
Problem Solve

OCR

- 5 (a) Two numbers are in the ratio 5 : 7.
The difference between the numbers is 12.

Work out the two numbers.

(a)and.....[2]

- (b) Three numbers have a mean of 9 and a mode of 7.

Work out the three numbers.

(b).....and.....and.....[2]

- 5 (a) Two numbers are in the ratio 5 : 7.
 The difference between the numbers is 12.

Work out the two numbers.

$$\begin{aligned} 2 \text{ parts} &= 12 \\ 1 \text{ part} &= 6 \end{aligned}$$

$$\begin{array}{c} 5 : 7 \\ \swarrow \times 6 \quad \searrow \times 6 \end{array}$$

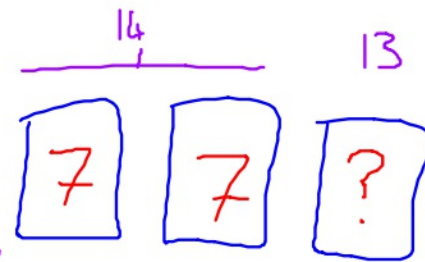
(a) 30 and 42 [2]

- (b) Three numbers have a mean of 9 and a mode of 7.

Work out the three numbers.

most

$$\begin{array}{r} 27 \\ \text{add up} \\ \hline 3 = 9 \end{array}$$



(b) 7 and 7 and 13 [2]

18 Jenny played four games of golf.
For these games her modal score was 76 and her mean score was 75.
Her range of scores was 10.

What were her scores for the four games?

..... [4]

18 Jenny played four games of golf. For these games her modal score was 76 and her mean score was 75. Her range of scores was 10.

most often

What were her scores for the four games?

→ +/÷

Modal... 76 76 76
x
86
—
66

Total score
 $\frac{300}{4} = 75$ $75 \times 4 = 300$

$$\begin{array}{r} 76 \\ +76 \\ \hline 152 \end{array} \quad \begin{array}{r} 300 \\ -152 \\ \hline 148 \end{array}$$

$$\begin{aligned} x + x + 10 &= 148 \\ 2x + 10 &= 148 \\ 2x &= 138 \\ x &= 69 \end{aligned}$$

x
69 76 76 79

19 The population of a village is in the following ratios.

- men : children = 11 : 3
- women : children = 5 : 2

(a) Find the ratio men : women.
Give your answer in its simplest form.

(a) : [2]

(b) There are 36 children in the village.
Find the total population of the village.

(b) [3]

19 The population of a village is in the following ratios.

Video created by W Neill

- men : children = 11 : 3
- women : children = 5 : 2

(a) Find the ratio men : women.
Give your answer in its simplest form.

$$\begin{array}{r} 22 \\ \times 6 \\ \hline 132 \end{array}$$

(b) There are 36 children in the village.
Find the total population of the village.

$$\begin{array}{r} 132 \\ 90 \\ 36 \\ \hline 258 \end{array}$$

$$\begin{array}{r} \text{men} : \text{Women} : \text{children} \\ 11 : : 3 \\ : 5 : 2 \\ 22 : 15 : 6 \end{array}$$

x3
x2

(a) $\frac{22}{\dots\dots\dots} : \frac{15}{\dots\dots\dots}$ [2]

M	W	C	
22	15	6	
x6 132	x6 90	x6 36	36 children = 6 parts 6 people = 1 part

(b) $\frac{258}{\dots\dots\dots}$ [3]

- 4 One morning, **eight** buses arrive at a bus stop.
The number of minutes late for each bus is shown below.

0 7 2 6 9 2 0 7

In the afternoon, two more buses arrive at the bus stop.

The median number of minutes late of **all ten** buses is 3.5.

The mode number of minutes late of **all ten** buses is 0.

How many minutes late were the two afternoon buses?

..... and minutes **[3]**

- 4 One morning, **eight** buses arrive at a bus stop.
The number of minutes late for each bus is shown below.

0, 7, 2, 6, 9, 2, 0, 7

In the afternoon, two more buses arrive at the bus stop.

The median number of minutes late of **all ten** buses is 3.5.

The mode number of minutes late of **all ten** buses is 0.

most often

How many minutes late were the two afternoon buses?

0 0 0 2 2 5 6 7 7 9
3.5

2, 5, 6

..... 0 and 5 minutes [3]

17 Ping chooses four numbers.

P17

The mode of these four numbers is 8, the range is 7 and the mean is 11.

Find Ping's four numbers.

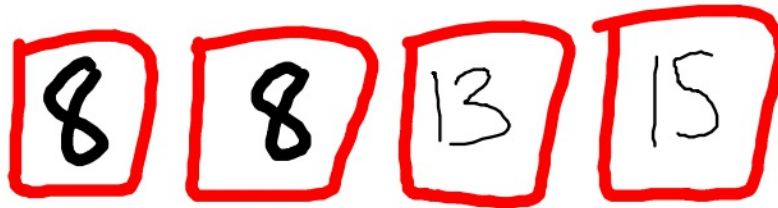
..... , , , [3]

17 Ping chooses four numbers.

P17

The mode of these four numbers is 8, the range is 7 and the mean is 11.

Find Ping's four numbers.



$$\frac{44}{4} = 11$$

8 8 13 15
.....,,, [3]

Edexcel

8 20 men, 10 women and 10 children are in a competition.

The mean score for the women is 15.6

The mean score for the children is 9.2

Kevin says that the mean score for all 40 people is 11.2

(a) Work out the mean score for the men.

.....
(3)

Kevin was wrong.

The mean score for all 40 people was actually 11.15

(b) How does this affect the mean score for the men?

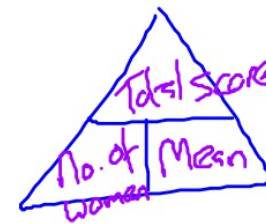
.....
.....
(1)

8 20 men, 10 women and 10 children are in a competition.

The mean score for the women is 15.6

The mean score for the children is 9.2

Kevin says that the mean score for all 40 people is 11.2



$$\begin{array}{r} 112 \\ \times 4 \\ \hline \end{array}$$

(a) Work out the mean score for the men.

Men women children Total

Kevin was wrong.

The mean score for all 40 people was actually 11.15

$$\begin{array}{r} 156 \\ + 92 \\ \hline 248 \end{array}$$

(b) How does this affect the mean score for the men?

- 12** In a class there are 11 boys and 19 girls.
The mean weight of all 30 children is 32.85 kg.
P17 The mean weight of the 11 boys is 31.9 kg.

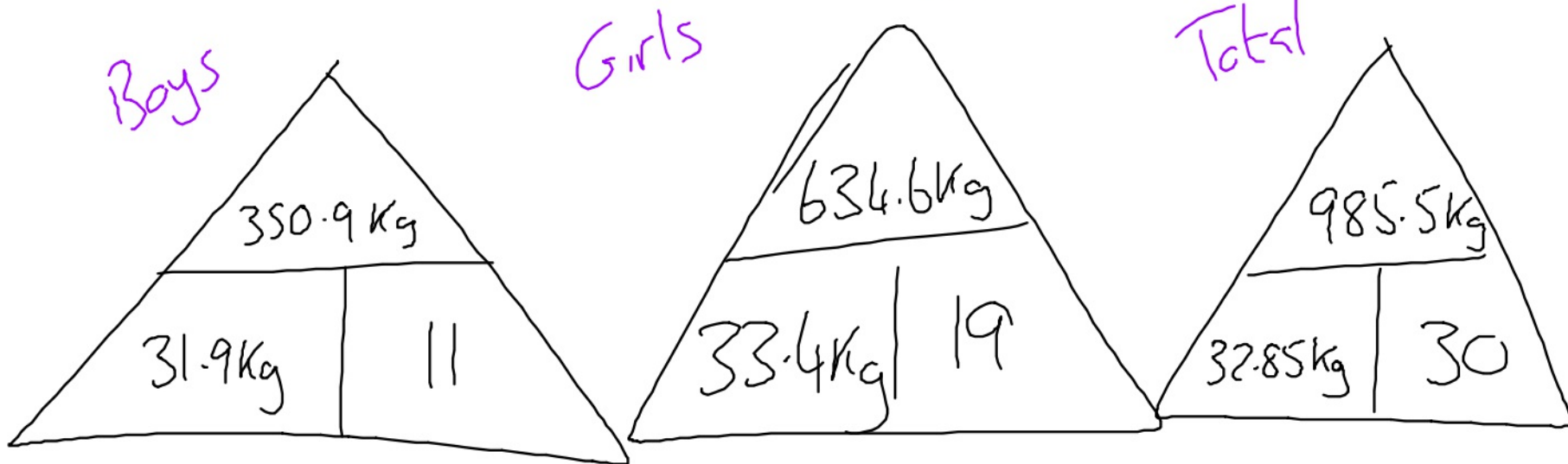
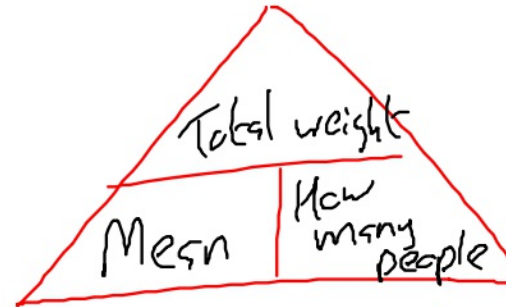
Work out the mean weight of the 19 girls.

.....kg

(Total for Question 12 is 3 marks)

- 12** In a class there are 11 boys and 19 girls.
The mean weight of all 30 children is 32.85 kg.
P17 The mean weight of the 11 boys is 31.9 kg.

Work out the mean weight of the 19 girls.



33.4 kg ✓

(Total for Question 12 is 3 marks)

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7 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.

.....
(Total for Question 7 is 3 marks)

- 7 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.

Girls

$$\frac{1080 \text{ marks}}{20} = 54$$

$$54 \times 10 \times 2$$

$$540 \times 2$$

Boys

$$\frac{720}{10} = 72 \checkmark$$

Total

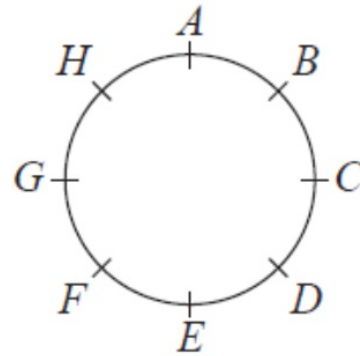
$$\frac{1800 \text{ marks}}{30} = 60$$

$$\underline{\underline{72 \checkmark}}$$

(Total for Question 7 is 3 marks)

3 Hasmeet walks once round a circle with diameter 80 metres.

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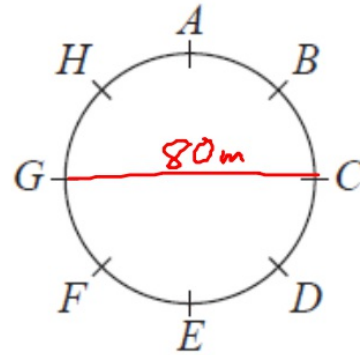
There are 8 points equally spaced on the circumference of the circle.

(a) Find the distance Hasmeet walks between one point and the next point.

.....m
(2)

3 Hasmeet walks once round a circle with diameter 80 metres.

Created by W Neill



There are 8 points equally spaced on the circumference of the circle.

(a) Find the distance Hasmeet walks between one point and the next point.

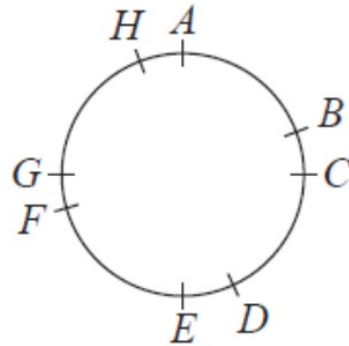
$$\begin{aligned} \text{Cir} &= D \times \pi \\ &= 80\text{m} \times \pi \\ &= 80\pi \text{ or } 251.32\dots \end{aligned}$$

$$\frac{80\pi}{8} =$$

$$\underline{\underline{31.4}} \text{ m}$$

(2)

Four of the points are moved, as shown in the diagram below.



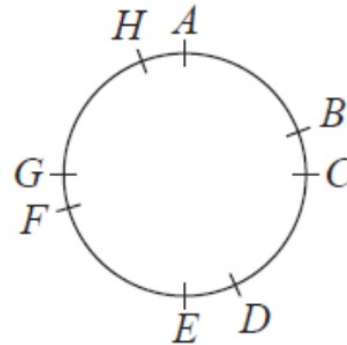
Hasmeet walks once round the circle again.

- (b) Has the mean distance that Hasmeet walks between one point and the next point changed?
You must give a reason for your answer.

.....

.....

Four of the points are moved, as shown in the diagram below.



Hasmeet walks once round the circle again.

- (b) Has the mean distance that Hasmeet walks between one point and the next point changed?
You must give a reason for your answer.

$$\text{Mean } \frac{\text{Total distance}}{\text{spaces}}$$

No distance doesn't change
spaces don't change

(1)

AQA

Video created by W Neill

18 Here are five cards.

P2
P17



One of the cards is removed.

The mean of the numbers on the remaining four cards is 6

Which card was removed?

You **must** show your working.

[3 marks]

Answer _____

18 Here are five cards.

P2
P17

$$\boxed{1} + \boxed{5} + \boxed{7} + \boxed{\cancel{9}} + \boxed{11} = 33$$

24 ← - 9

One of the cards is removed.

The mean of the numbers on the remaining four cards is 6

Which card was removed?

You **must** show your working.

$$\frac{24}{4} = 6$$

Total

[3 marks]

Answer

9

13

In a class of 28 students

P17

the mean height of the 12 boys is 1.58 metres

the mean height of all 28 students is 1.52 metres.

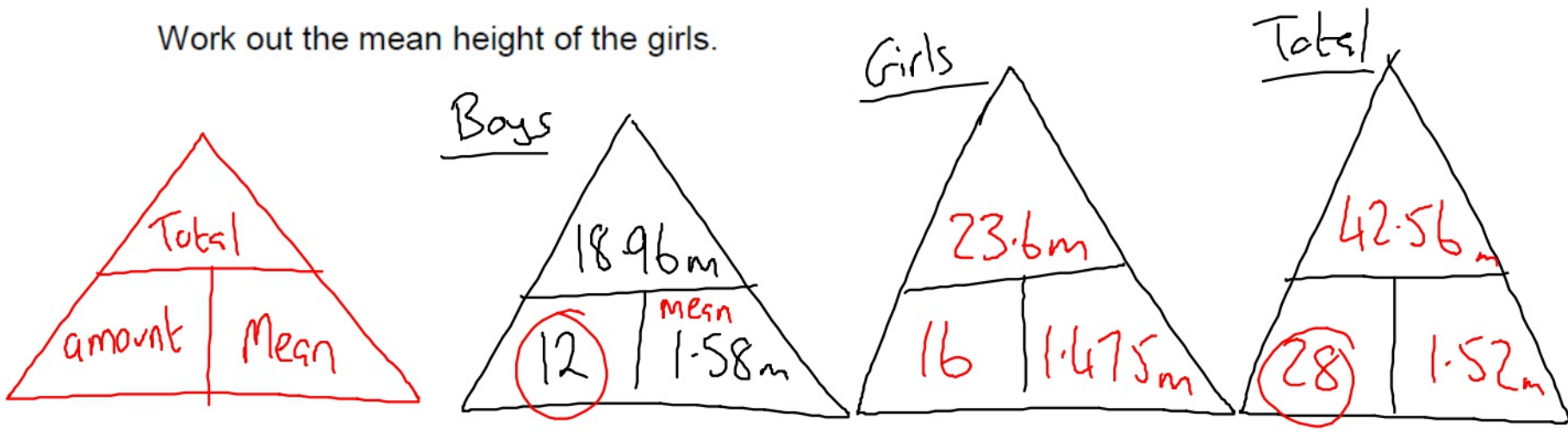
Work out the mean height of the girls.

[4 marks]

Answer _____ metres

13 In a class of 28 students
P17 the mean height of the 12 boys is 1.58 metres
the mean height of all 28 students is 1.52 metres.

Work out the mean height of the girls.



Answer 1.475 ✓ metres

14 The mean mass of a squad of 19 hockey players is 82 kg
A player of mass 93 kg joins the squad.

P17 Work out the mean mass of the squad now.

[3 marks]

Answer _____ kg

- 14 The mean mass of a squad of 19 hockey players is 82 kg
A player of mass 93 kg joins the squad.

P17 Work out the mean mass of the squad now.

[3 marks]

Total weight of 19

$$= 19 \times 82 \text{ kg} = 1558 \text{ kg}$$

$$\begin{aligned} 20 &= 1558 + 93 \\ &= 1651 \text{ kg} \end{aligned}$$

$$\text{Mean } \frac{1651}{20}$$

Answer 82.55 ✓ kg