

# Averages from Tables

Answers www.m4ths.com

① (a) Should divide by sum of frequency which is 20, not 4.

$$\textcircled{b} \frac{(2 \times 0) + (13 \times 1) + (4 \times 2) + (1 \times 3)}{20}$$

$$= \frac{0 + 13 + 8 + 3}{20}$$

$$= \frac{24}{20}$$

$$= 1.2 \checkmark$$

② The mode is 1 with a frequency of 13.

③ 1

④ The range is 3 (3-0).

Fred has done the range of the frequency.

⑤  $3 - 0 = 3$ . This is the range of phones owned by people.

$$\textcircled{2} \frac{(23 \times 0) + (5 \times 1) + (1 \times 2) + (0 \times 3) + (1 \times 4) + (0 \times 5)}{30}$$

$$= \frac{0 + 5 + 2 + 0 + 4 + 0}{30}$$

$$= \frac{11}{30} \text{ or } 0.36 \text{ which is } 0.37 \text{ hp.}$$

$$\textcircled{3} \frac{2+2+12+10+6+9+64+27+10}{35}$$

$$= 6.4$$

④ Grouped data. We don't know the exact value of each height.

⑤ Yes he is correct

$$\textcircled{c} \frac{158}{17} = 9.29 \text{ to 2dp.}$$

⑥ The smallest could be 6cm and the tallest 10cm which gives a range of 4cm  $\therefore$  5cm could be correct.

$$\textcircled{5} \frac{(5 \times 1) + (12 \times 4) + (10 \times 8) + (3 \times 15)}{30}$$

$$\textcircled{a} = \frac{5 + 48 + 80 + 45}{30}$$

$$= \frac{178}{30} \text{ or } 5.93$$

⑦ Grouped data means we don't know the exact time spent by each student.

⑧ 30 students

The median will be in the second class as  $\frac{30}{2} = 15$ . The second class is  $2 < N \leq 6$   $\therefore$  median between 2 and 6 not 0.5.

⑨ Increase as  $7 > 5.93$

$$\textcircled{6} \textcircled{a} \frac{(12 \times 90) + (3 \times 110) + (7 \times 140)}{22}$$

$$= 108.6 \text{ to 1 dp.}$$

$$\textcircled{b} 160 - 80 = 80 \text{ cm}$$

© Median using interpolation:

$$\frac{22}{2} \therefore 11^{\text{th}} \text{ data item}$$

The median will be in the interval  $80 \leq h < 100$  and could have been 92.

⑦ a) FFCCCT

© Small number of observations where data has large spread.

The likelihood of multiple values being the same is low given (t) is to the second.

© No outliers and units are time

$$\textcircled{8} \textcircled{a} \frac{21}{2} = 11.5^{\text{th}} \text{ value.}$$

Using CF: 6, 8, 14, 21, 21

$$60 + \left(\frac{3.5}{6}\right) \times 10 = \underline{65.8}$$

$$\textcircled{b} 80 - 49 = 31$$

$$\textcircled{c} \{x < 40\} \cup \{x \geq 80\}$$

$$\textcircled{d} \frac{270 + 110 + 390 + 525}{21} = 61.7$$

© The mode is 0, The mean will have to have a value greater than 0 as 7 people have an average greater than 0.

© Median will be in the same class interval as mode as  $\frac{20}{2} = 10.5$  and there are 13 in the class

$$\textcircled{c} \frac{(13 \times 0) + (2 \times 1) + (7 \times 4)}{20} = 1.5$$

$$\textcircled{d} 2 - 0 = 2$$

© let the missing values be  $x$  and  $y$  and use simultaneous equations:

$$\textcircled{2x + y = 10} \text{ (based on } \Sigma f) \text{ ①}$$

$$\frac{3 + 2x + 3y + 20 + 15}{32} = 2$$

$$\textcircled{2x + 3y = 26} \text{ based on mean ②}$$

$$\begin{aligned} 2x + 3y &= 26 \\ 2x + 2y &= 20 \end{aligned} \therefore \underline{y = 6} \text{ and } \underline{x = 4}$$

4 goes in the frequency for 2  
6 goes in the frequency for 3

© # | Frequency

0	0
1	0
2	1
3	2
4	3
5	25

© a) 9

© b) 5

© # |

0	24	✓ median = 0
1	0	
2	0	
3	1	
4	2	
5	3	

$$\textcircled{12} \frac{30 + \left(\frac{10+y}{2}\right) \times 8 + \left(\frac{y+40}{2}\right) \times 4 + 90}{20} = 15.6$$

$$\therefore \underline{y = 12} \Rightarrow 10 + \left(\frac{4.5}{8}\right) \times 1 = \underline{10.5625}$$