Test answers - Data: averages and charts

Year: Year 7 · Duration: 45 minutes · /20

Answer to Question 1 (4 marks)

a. The mode is the value that occurs most often. The number 5 appears twice while every other value appears once, so the mode is **5**. (1 mark)
b. Put the data in order first: 5, 5, 7, 9, 12, 14, 20. With 7 values, the median is the $\frac{7+1}{2} = 4$th value, which is **9**. (1 mark)
c. Add all the values: $12 + 5 + 9 + 20 + 5 + 14 + 7 = 72$. Divide by the number of pupils: $72 \div 7 = 10.28\ldots$, so the mean is **10.3** messages to 1 d.p. (1 mark)
d. The range is largest minus smallest: $20 - 5 =$**15**. (1 mark)

The mean is higher than the median because the value 20 pulls it upwards.

Answer to Question 2 (4 marks)

a. The modal number of pets has the highest frequency. The biggest frequency is 9, which belongs to 1 pet, so the mode is **1** (not 9). (1 mark)
b. Multiply each number of pets by its frequency: $0 \times 4 = 0$, $1 \times 9 = 9$, $2 \times 7 = 14$, $3 \times 3 = 9$, $4 \times 2 = 8$. The total is $0 + 9 + 14 + 9 + 8 =$**40** pets. (1 mark)
c. Mean = total number of pets ÷ number of pupils $= 40 \div 25 =$**1.6** pets. (1 mark)
d. There are 25 pupils, so the median is the 13th value. Running totals: 4 pupils have 0 pets, then $4 + 9 = 13$ pupils have 0 or 1 pet. The 13th pupil has 1 pet, so the median is **1**. (1 mark)

Answer to Question 3 (4 marks)

a. The whole circle is 360° and represents 60 pupils, so each pupil is shown by $360 \div 60 = 6^\circ$. Walkers have 150°, so $150 \div 6 =$**25** pupils walk. (1 mark)
b. The car sector is 72°, so $72 \div 6 =$**12** pupils travel by car. (1 mark)
c. The cycling sector is 48°, which is $48 \div 6 = 8$ pupils (1 mark). As a percentage of the class: $\frac{8}{60} \times 100 = 13.33\ldots$, which is **13.3%** to 1 decimal place (1 mark).

Check: the bus sector gives $90 \div 6 = 15$ pupils, and $25 + 15 + 12 + 8 = 60$. The percentage can also be found directly from the angle: $\frac{48}{360} \times 100 = 13.3\%$.

Answer to Question 4 (4 marks)

a. Mia's times total $38 + 40 + 37 + 39 + 38 + 44 = 236$, so her mean is $236 \div 6 =$

39.3 s and her range is $44 - 37 =$**7 s**. Noah's times total $36 + 41 + 35 + 42 + 34 + 46 = 234$, so his mean is $234 \div 6 =$**39 s** and his range is $46 - 34 =$**12 s**. (1 mark for each swimmer)

b. In swimming a lower time is better. Noah's mean (39 s) is lower than Mia's (39.3 s), so **Noah** is slightly faster on average. (1 mark)

c. A smaller range means the times are closer together. Mia's range of 7 s is smaller than Noah's 12 s, so **Mia** is more consistent. (1 mark)

Answer to Question 5 (4 marks)

a. Take the other three sports away from the 50 pupils: $50 - 18 - 12 - 10 =$**10** choose athletics. (1 mark)

b. The 360° of the circle are shared among 50 pupils, so each pupil gets $360 \div 50 = 7.2^\circ$ (1 mark). Football $18 \times 7.2 = 129.6^\circ$, netball $12 \times 7.2 = 86.4^\circ$, swimming $10 \times 7.2 = 72^\circ$ and athletics $10 \times 7.2 = 72^\circ$ (1 mark for all four angles).

c. Netball has 12 out of 50 pupils: $\frac{12}{50} \times 100 =$**24%**. (1 mark)

Check the pie chart before drawing it: $129.6 + 86.4 + 72 + 72 = 360^\circ$, so the sectors fill the whole circle exactly. Use a protractor and measure each sector from the end of the previous one.