Year 9 Statistics – Challenge

ANSWER KEY HappyKids.fit

Answers and worked solutions · 8 questions

A. Think like a mathematician

1. **It is misleading because the percentages add up to 110%, so the chart cannot be correct.**
   Look at the scale, the sample, the pictures and the claim
   Problem: the percentages add up to 110%, so the chart cannot be correct
   A fair version would correct this

2. **It is misleading because the mean is pulled up by one extreme value, so the median would describe a typical worker better.**
   Look at the scale, the sample, the pictures and the claim
   Problem: the mean is pulled up by one extreme value, so the median would describe a typical worker better
   A fair version would correct this

3. **The frequencies matter, not the number of classes. With 40 values the median is the 20th and 21st value, in the class $6 < m \leq 8$.**
   Error: the frequencies were ignored
   Median position: the 20th and 21st of 40 values
   Running totals: 6, 8, 19, 27, 40 → $6 < m \leq 8$

4. **The 4 people who like both were counted twice: 20 + 16 − 4 = 32 people.**
   Error: the overlap was counted twice
   Only French: 20 − 4 = 16; only Spanish: 16 − 4 = 12
   Total: 16 + 4 + 12 = 32

5. **No. Both may depend on a third factor, e.g. ice-cream sales and sunburn both rise in hot weather.**
   Think of an example or a counter-example
   Both may depend on a third factor, e.g. ice-cream sales and sunburn both rise in hot weather.
   Decide

6. **No. The total in A also includes the overlap with B.**
   Think of an example or a counter-example
   The total in A also includes the overlap with B.
   Decide

7. **Class A: median 40, range 26. Class B: median 32, range 23. Class A did better on average; Class B has the smaller range, so its marks were more consistent.**
   Class A: 11 values; median = value 6 = 40; range = 49 − 23 = 26
   Class B: 9 values; median = value 5 = 32; range = 45 − 22 = 23
   Compare an average (the median) and the spread (the range), in context

8. **a scatter graph: it shows whether two variables are related (correlation).**
   Choose: a scatter graph
   Because it shows whether two variables are related (correlation)