Worked answers | Statistics

Misleading graphs and representations

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Attendance rises from 120 to 132. Find the numerical and percentage increases. [3 marks]

Increase $= 12$.

$12/120 \times 100 = 10\%$.

Answer: 12 people; 10%.

2. A poll reports 80% agreement without giving a sample size. Name two missing details that matter. [2 marks]

80% of 5 has different stability from 80% of 5,000.

Voluntary or biased selection may distort the proportion.

Answer: Sample size and selection method.

3. A has 8 late appointments out of 100; B has 12 out of 200. Compare late rates. [2 marks]

$8/100 = 8\%$.

$12/200 = 6\%$.

Answer: A: 8%; B: 6%; B is lower.

4. A graph places years 2010, 2011 and 2020 equally far apart. Explain the issue. [2 marks]

Equal horizontal distances should mean equal times when showing change.

Use proportional spacing or a different clearly explained display.

Answer: A nine-year interval is drawn the same width as a one-year interval.

5. An icon doubles in both height and width. By what factor does its area change, and why can this mislead? [2 marks]

Area factor $= 2 \times 2 = 4$.

Viewers may infer four times the quantity when only doubling was intended.

Answer: Area becomes four times as large.

6. Ice-cream sales and swimming incidents both rise in hot weather. Does this prove ice cream causes incidents? [2 marks]

The evidence shows an association.

Other explanations and appropriate study evidence are needed for causation.

Answer: No; hot weather may influence both.