Worked answers | Statistics

Population estimates and uncertainty

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. A sample of 40 trees has 14 gum trees. Estimate the gum trees among 600 trees. [2 marks]

$\frac{14}{40} = 0.35.$

$0.35 \times 600 = 210.$

Answer: About 210.

2. 52 of 80 surveyed students walk or cycle. Estimate the count among 500 students. [2 marks]

$\frac{52}{80} = 0.65.$

$0.65 \times 500 = 325.$

Answer: About 325.

3. A sample suggests 27% of 880 households own a dog. Give a sensible estimated count. [2 marks]

$0.27 \times 880 = 237.6.$

Round to a whole household and retain about.

Answer: About 238 households.

4. Two fair samples give 42% and 47%. Must one be wrong? [2 marks]

The selected people differ.

The sample proportions need not match exactly.

Answer: No. Ordinary sampling variation is possible.

5. A biased sample of 1,000 gives 70%. A fair random sample of 150 gives 48%. Which method is preferable for the target population? [2 marks]

Representativeness matters.

Large size does not remove selection bias.

Answer: The fair sample of 150, assuming a suitable frame and response quality.

6. Samples give 61%, 58%, 63% and 60%. Find their range in percentage points. [2 marks]

The largest is 63% and smallest 58%.

$63 - 58 = 5$ percentage points.

Answer: 5 percentage points.