

Grade 7 - Random Sampling and Inference - Test Answer Key

Common Core 7.SP.A.1, 7.SP.A.2 · maths-pdf.fr/en/

Use this answer key and scoring guide to grade the random sampling test. Each solution shows the full work, and the scoring note explains how the points are awarded. Give partial credit for correct steps even when the final answer is wrong.

Grade 7 · Common Core State Standards: **7.SP.A.1, 7.SP.A.2**

Question 1 - Population and sample [2 pts]

Population: all 500 voters. Sample: the 30 surveyed voters.

The sample is used to make an inference about the whole population.

Population 500 voters; sample 30 voters

Scoring: 1 point for each correct name.

Question 2 - Choose the sample [2 pts]

Method C is random.

Method B is biased: people at a gym may prefer workout music. Method A is biased toward concert goers.

Method C

Scoring: 1 point for C; 1 point for a valid reason.

Question 3 - Estimate the population [2 pts]

$$21 \div 70 = 0.3.$$

$$0.3 \times 1500 = 450$$

About 450 students

Sample	70 students	
Ride bus	21	49

21 of 70 is 3 tenths, or 30%.

Scoring: 1 point for the sample proportion; 1 point for the estimate.

Question 4 - Variability [2 pts]

The 11 values in order have median the 6th value: 16%.

$$0.16 \times 2000 = 320$$

Median 16%; about 320 students

Scoring: 1 point for the median; 1 point for the estimate.

Question 5 - Random method [2 pts]

Number the students 1 to 150, then use a random number generator to pick 25 different numbers.

Every student has the same chance of being picked.

Numbered list with random numbers

Scoring: 1 point for a method; 1 point for the reason it is random.

Question 6 - Tag and recapture [2 pts]

$6 \div 30 = 0.2$, so the tagged deer are about 20% of all deer.

$$40 \div 0.2 = 200$$

About 200 deer

Scoring: 1 point for the sample proportion; 1 point for the estimate.

Question 7 - Compare predictions [2 pts]

Noah: $33 \div 110 = 0.3 = 30\%$.

Noah's sample is larger, so it varies less and gives a better prediction.

Noah's

Scoring: 1 point for the choice; 1 point for the reason.

Question 8 - Three samples [3 pts]

- a. $22 \div 40 = 55\%$, $26 \div 40 = 65\%$, $24 \div 40 = 60\%$.
- b. $(22 + 26 + 24) \div 120 = 72 \div 120 = 60\%$.
- c. $0.6 \times 800 = 480$ students.

Sample	Percent
1	55%
2	65%
3	60%
Combined	60%

Percents.

Scoring: 1 point for each part.

Question 9 - Sampling variability [3 pts]

- a. The 12 values in order: the median is the mean of the 6th and 7th, $(54 + 54) \div 2 = 54\%$.
- b. $60 - 48 = 12$ percentage points.
- c. $0.54 \times 20000 = 10800$; samples vary by chance, so the true value may be different.

Scoring: 1 point for each part.

Total

20 points