

Random Sampling and Comparing Populations: math test, Grade 7 – download the PDF

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1

Vocabulary of sampling

/ 3 pts

A principal wants to know the average number of books read this year by the 900 students of her school. She chooses 45 students with a random number generator applied to the student list.

- a. What is the population?
- b. What is the sample?
- c. Why is this sample likely to be representative?

2 Estimating from a sample

/ 4 pts

A school has 2,400 students. In a random sample of 60 students, 18 ride the bus. A second random sample of 60 students gives 21 bus riders.

- Find the proportion of bus riders in the first sample.
- Estimate the number of bus riders in the school from the first sample.
- Estimate it again from the second sample.
- A parent says that at least 1,000 students ride the bus. Do the samples support this claim? Explain.

3 Center and spread

/ 4 pts

Eleven students recorded the number of text messages they sent yesterday: 2, 3, 5, 5, 6, 7, 8, 8, 9, 11, 13.

- Find the mean.
- Find the median.
- Find Q_1 and Q_3 .
- Find the range and the IQR.

4 Two bakers

/ 4 pts

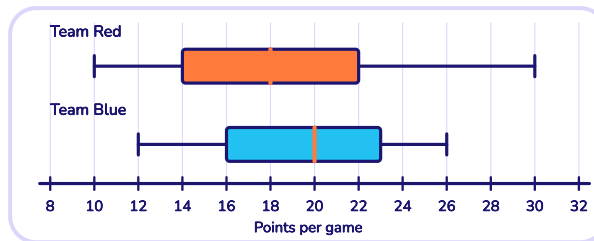
The number of cookies sold by Ben over five days: 22, 24, 25, 26, 28. By Cara: 20, 23, 25, 27, 30.

- Find the mean of each baker.
- Find the mean absolute deviation of each baker.
- Which baker has the more consistent sales? Explain.

5 Reading two box plots

/ 3 pts

The box plots show the points scored per game by two basketball teams.



- Give the median of each team.
- Find the IQR of each team.
- Which team usually scores more, and which is more consistent? Explain.

6 A poll at the game

/ 2 pts

A student wants to know whether the students of her school like the school mascot. She asks 20 people leaving a basketball game. Is her sample random? Is it likely to be representative? Explain, and suggest an improvement.



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