Statistical Questions

Statistical questions: Applications and decisions

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A statistical question anticipates variability in data collected about a group or repeated events. How many minutes do our classmates read daily? may give $10, 20, 35$ minutes. How many minutes did Jo read yesterday? asks for one fixed value, such as 20. A sample can happen to contain equal values and still answer a statistical question.

Worked example

Classify the question and explain. “How many books do students in this class read each month?” Use observations $1, 3, 5, 2$.

1. The stated data are $1, 3, 5, 2$. There are 4 observations from a group or repeated events.

2. Observed spread $= 5 - 1 = 4$; the question allows different values, even if this sample happens to have no spread.

Answer: Statistical.

Practice Problems

Show your thinking.

1. Choose whether this survey can study differences in exercise. “How many minutes do students exercise each day?” Use observations $15, 30, 45, 20$.

2. A planner wants attendance variability. Rewrite the fixed question. “How many students attended this one meeting?” Use observations 18.

3. Classify a question for a garden study. “How much water do plants use during a week?” Use observations $2, 3, 5, 4$.

4. Recover a statistical version for product measurements. “What is the capacity of this bottle?” Use observations 500.

5. A student says every statistical question needs hundreds of answers. Use this small group to correct that. “How many goals are scored in each match?” Use observations $1, 4, 2, 3$.

6. Explain what one observation represents and why several are collected. “On Tuesday, how many minutes did each student in this class spend on homework?” Use observations $25, 40, 35, 15$.

Answer Key

1. Statistical.

2. Not statistical. How many students attend each of our weekly meetings?

3. Statistical.

4. Not statistical. What are the measured fill volumes of bottles from this production line?

5. Statistical.

6. One observation is one student's homework time that Tuesday, in minutes. Several students show how those times vary.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The stated data are $15, 30, 45, 20$. There are 4 observations from a group or repeated events.

2. Observed spread $= 45 - 15 = 30$; the question allows different values, even if this sample happens to have no spread.

Problem 2

1. The stated data are 18. There is one fixed observation about the specified case.

2. Observed spread $= 18 - 18 = 0$; the question requests one fixed result, not a variable group distribution.

3. A group-based revision is: How many students attend each of our weekly meetings?

Problem 3

1. The stated data are $2, 3, 5, 4$. There are 4 observations from a group or repeated events.

2. Observed spread $= 5 - 2 = 3$; the question allows different values, even if this sample happens to have no spread.

Problem 4

1. The stated data are 500. There is one fixed observation about the specified case.

2. Observed spread $= 500 - 500 = 0$; the question requests one fixed result, not a variable group distribution.

3. A group-based revision is: What are the measured fill volumes of bottles from this production line?

Problem 5

1. The stated data are $1, 4, 2, 3$. There are 4 observations from a group or repeated events.

2. Observed spread $= 4 - 1 = 3$; the question allows different values, even if this sample happens to have no spread.

Problem 6

1. A recorded value such as 25 is the number of minutes one student spent on homework that Tuesday.

2. Students can spend different amounts of time; the observed values run from 15 to 40 minutes, a spread of 25 minutes.

3. One student gives only one time. Observing several lets us see differences across the class, so this is statistical.

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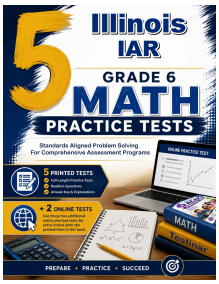

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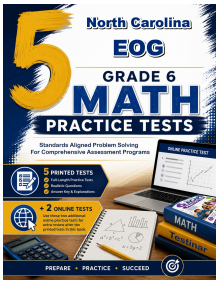

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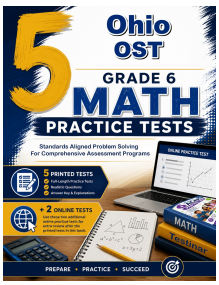

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