Random Samples and Populations

? ESSENTIAL QUESTION

How can you use random samples and populations to solve real-world problems?

EXAMPLE

An engineer at a lightbulb factory chooses a random sample of 100 lightbulbs from a shipment of 2,500 and finds that 2 of them are defective. How many lightbulbs in the shipment are likely to be defective?

$$\frac{\text{defective lightbulbs}}{\text{size of sample}} = \frac{\text{defective lightbulbs in population}}{\text{size of population}}$$

$$\frac{2}{100} = \frac{x}{2,500}$$

$$\frac{2 \cdot 25}{100 \cdot 25} = \frac{x}{2,500}$$

$$x = 50$$

In a shipment of 2,500 lightbulbs, 50 are likely to be defective.

EXERCISES

1. Molly uses the school directory to select 25 students at random from her school for a survey on which sports people like to watch on television. She calls the students and asks them, "Do you think basketball is the best sport to watch on television?" (Lesson 12.1)

    a. Did Molly survey a random sample or a biased sample of the students at her school?

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    b. Was the question she asked an unbiased question? Explain your answer.

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2. There are 2,300 licensed dogs in Clarkson. A random sample of 50 of the dogs in Clarkson shows that 8 have ID microchips implanted. How many dogs in Clarkson are likely to have ID microchips implanted? (Lesson 12.2)

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