

Day 57

12.5 Working with Samples

Sample Proportion is a ratio $\frac{x}{n}$

x = # of times an event occurs

n = sample size

✓ #1 $x = 564$ $n = 1085$

$$\frac{564}{1085} = 52\%$$

more variation = smaller sample
less variation = larger sample

Margin of Error : $\pm \frac{1}{\sqrt{n}}$

★ the larger the sample size,
the smaller the margin of error

✓ #4 (a) $\pm 10\%$ $\pm \sqrt{n} = \frac{1}{\text{margin of error}}$

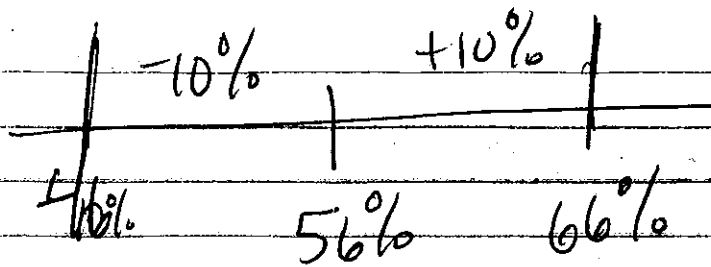
Find the sample size

\downarrow
 $.10$

$$\pm \sqrt{n} = \frac{1}{.10} \quad \div$$
$$(\pm \sqrt{n})^2 = (10)^2 \quad \text{square}$$

$n = 100$ voters.

(b) $\pm 4\%$ $\pm \sqrt{n} = \frac{1}{.04}$ $(\pm \sqrt{n})^2 = (25)^2$
 $n = 625$



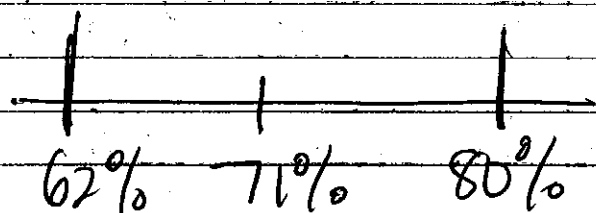
ex 5 Find the Margin of Error.

$$\text{sample proportion} = \frac{87}{123} \approx 71\%$$

$$\text{margin of error} = \pm \frac{1}{\sqrt{123}} = \pm 9\%$$

$$\text{interval: } \begin{cases} 71 + 9 = 80\% \\ 71 - 9 = 62\% \end{cases}$$

$$71\% \pm 9\%$$



Quick V # 3

B is a larger sample and has less variation because it has the smallest standard deviation.

Practice 12-5

Working with Samples

1. In a survey, participants were asked their opinion of a new government program. The response scale ranged from 1 to 4, with 4 being a favorable response to the program. Which sample was largest? Explain.

Sample	Score	Standard Deviation
A	3.0	1.1
B	2.8	1.3
C	2.9	0.8

Identify any bias in each sampling method. When appropriate, suggest a sampling method that is more likely to produce a random sample.

2. A committee wants to find how much time students spend reading each week. They ask the students as they enter the library.
3. The students planning the junior class party want to know what kinds of pizza to buy. They ask the pizza restaurant what kinds sell the most.
4. The county road department wants to know which roads cause the most concern among the residents of the county. They ask the local restaurant to hand out survey forms.
5. A politician wants to know what issues are most important to the voters in his district. He spends all day Tuesday talking to people as they enter the grocery store.
6. A politician wants to know the voters' views on an important issue. She has her campaign workers call people randomly from the phone book.

Find the sample size that produces each margin of error.

7. $\pm 15\%$

8. $\pm 2\%$

9. $\pm 0.9\%$

10. $\pm 0.6\%$

For each sample find the sample proportion, the margin of error, and an interval likely to contain the true population proportion. Round to the nearest percent.

11. In a survey of 38 parents of preschool children, 20 would like to have their local school district provide play group sessions at least one evening a month.

$$\frac{20}{38} = 52.6\%$$

12. In a random sample of 526 visitors to the craft center, 378 want the craft center to be open later in the evenings.

13. In a survey of 165 visitors to the library, 102 want the library to have more novels available.

14. In one lake, 98 of the last 323 fish caught have a certain chemical present in their body.

15. In a traffic survey, 537 of the 1287 drivers passing through the checkpoint were traveling more than 100 miles from home.
