

Results of the driver fee survey:

In favor of raising fees = 108

Against raising fees = 462

> $\frac{108}{570}$ TOTAL%

What percent of people favor raising driver fees to fix the roads? $\frac{108}{570} = 18.9\%$

This is called the Sample Proportion

Sample Proportion:

The ratio of: $\frac{\text{\# times an event occurs}}{\text{Sample Size}}$

Sample Proportion:

Example:

In a sample of 500 TV viewers, 159 watch the 11:00pm news. Find the sample proportion.

$$\frac{159}{500} \times 100 = 31.8\%$$

The greater the sample size the less variation in the data can be expected.

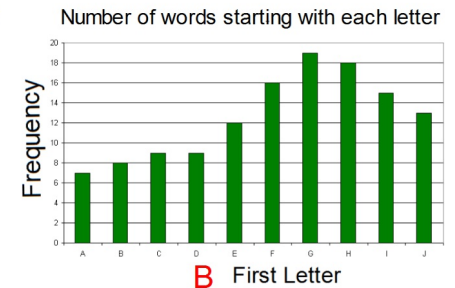
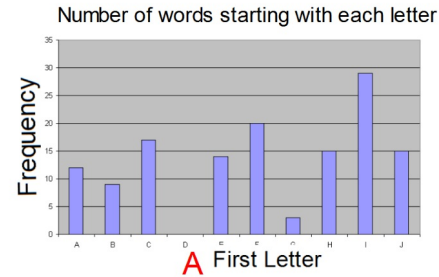
Sample	Score	Stand Dev
A	4.4	1.4
B	4.6	0.6
C	4.6	1.2

Which sample was most likely the greatest in size? **B**

has the least variation (smallest standard deviation)

Which sample was most likely the smallest? **A**

has the most variation (largest standard deviation)



The two charts show the number of words found in two a sample passage from two different books. Which sample was most likely the largest?

B it has less variation

According to a CNN/Time poll, among likely voters, Murkowski and Miller each take 37 percent while Democrat Scott McAdams is pulling 23 percent with a 3.5 percent margin of error.

37 \pm 3.5
 33.5% to 40.5%

Margin of Error:

A range of values that most likely contains the actual population proportion.

Usually given as $\pm\%$.

A poll leading up the election shows that Jones is favored by 43% of the people. The poll has a margin of error of $\pm 4\%$. What is the range of voters that can be expected to vote for Jones?

$$43 \pm 4 =$$

39% to 47%

The same poll a month ago showed the pair in a statistical dead heat, with Berg edging Pomeroy by three points, with a 4.5 percent margin of error

$$3\% \pm 4.5\%$$

$$-1.5\% \quad 7.5\%$$

HOW SHOULD WE INCREASE ROAD FUNDING?

VOTERS SAY DRIVER FEES ARE A BAD IDEA

QUESTION: Some people have suggested that a good way to provide the increased funding needed to improve and repair the roads is to change to a system where motorists pay a new fee that would be based on several factors, including the number of miles they drive, the time of day they travel, the route taken and the weight of the vehicle they drive. Do you think this is a good idea or a bad idea?

BAD IDEA

77%

GOOD IDEA

18%
5% Undecided/
refused

VOTERS OPPOSED TO TOLL ROADS

QUESTION: Another proposal recently discussed as a way to provide increased funding for road repairs and improvements in Michigan would be to convert several interstate highways in Michigan to toll roads. Do you favor or oppose this proposal?

OPPOSE

55%

FAVOR

38%
7% Undecided/
refused

BAD IDEA

77%

GOOD IDEA

18%

5%
Undecided/
refused

error margin of ± 4 percentage

What interval most likely contains the actual percent of voters who think increasing driver fees is a Bad Idea?

$$77\% \pm 4\% = 73\% \text{ to } 81\%$$

Margin of Error Formula:

$$\pm \frac{1}{\sqrt{n}} \quad n = \text{sample size}$$

Convert this to a percent by x100.

SOURCE: Exclusive poll done for the Free Press/WXYZ-TV (Channel 7) and our statewide media polling partners. The survey was done May 17-20 by Lansing-based EPIC-MRA. It was a 600-voter sample, using 20% cell phones, with an error margin of +/- 4 percentage points. About 20% of respondents were union members and 58% of respondents were at

A random sample of 275 people shows that 44% are not satisfied with the job the governor is doing so far. What is the margin of error of this survey?

$$\frac{1}{\sqrt{275}} \times 100 \pm 6\%$$

What is the interval that is most likely to contain the **population proportion** for the percent of people that are not satisfied?

$$44\% \pm 6\%$$

$38\% \text{ to } 50\%$

What happens to the margin of error as the sample size increases?

Margin of error should decrease with a larger sample size

As sample size decreases?

Margin of error should increase with a smaller sample size.

What sample size would give the most accurate results?

The entire population - - EVERYBODY!

A poll take before an election shows that 52% of registered voters are in favor of the Proposal. If the survey has a margin of error of $\pm 4\%$ estimate the number of voters in the poll to the nearest whole number.

$$\left(\frac{1}{\sqrt{n}}\right)^2 = \left(\frac{.04}{1}\right)^2 \quad \left(\frac{1}{\sqrt{n}}\right) \times \frac{100}{100} = \frac{4}{100}$$

$n = 625$

$1 = .04\sqrt{n} \quad \frac{1}{\sqrt{n}} = \frac{.04}{1}$