

Margin of Error

• gives a limit on how much the response of a sample would differ from the responses of a population.

$$MOE = \pm \frac{1}{\sqrt{n}} \% \cdot n \text{ is the sample size}$$

• if the percent of the sample responding is p , then the percent of the population that would respond the same way is between:

$$p - \frac{1}{\sqrt{n}} \% \quad \text{and} \quad p + \frac{1}{\sqrt{n}} \%$$

Examples

1. Find the margin of error for a survey with a sample size of 664 people.

$$MOE = \pm \frac{1}{\sqrt{664}} \% \quad \pm 3.9\%$$

2. Find the margin of error for a survey with a sample size of 773 people.

$$\pm 3.6\%$$

3. Find the margin of error for a survey with a sample size of 3444 people.

$$\pm 1.7\%$$

WHAT DO YOU NOTICE HAPPENS TO THE SAMPLE SIZE GETS BIGGER?

Examples

1. Find the results for a survey with a sample size of 664 people and a 54% "yes" rate.

$$54\% \pm 3.9\% = 50.1 - 57.9\%$$

2. Find the margin of error for a survey with a sample size of 773 people and a 27% "yes" rate.

$$23.4 - 30.6\%$$

3. Find the margin of error for a survey with a sample size of 3444 people and a 45.7% "yes" rate.

$$44 - 47.4\%$$

Examples

4. Given the margin of error, $\pm 3\%$ find the sample size.

$$n = \frac{1}{\text{decimal}^2} \quad 1111$$

5. Given the margin of error, $\pm 6.2\%$ find the sample size.

$$260$$

6. Given the margin of error, $\pm 0.6\%$ find the sample size.

$$27,778$$

WHAT DO YOU NOTICE HAPPENS TO THE SAMPLE SIZE AS THE MARGIN OF ERROR GETS BIGGER?

Examples

7. Given that a survey had a "yes" range of 66.7 – 77.3%, how many people were surveyed?

$$356$$