A survey of 750 people taken at local a mall shows that 545 people would be interested in shopping at an organic grocery store.

Find the sample proportion to the nearest hundredth.

$\frac{545}{750} = 72.67$

Margin of Error Formula:

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

Convert this to a percent by x100.

A random sample of 1200 people shows that 77% are not satisfied with the president so far.

a) What is the margin of error in this survey as a whole %?

$\frac{1}{\sqrt{1200}} \times 100 = \pm 3\%$

b) Find the interval that most likely contains the population proportion for the percent of people disatisfied with the president?

74% to 80%

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

Margin of error should decrease with a larger sample size

$\pm\frac{1}{\sqrt{n}}$

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 survey of TV viewers shows that 62% prefer to watch a sit-com versus a drama. If the margin of error in the survey is ±5% estimate the number of viewers in the survey to the nearest whole number.

$$\left(\frac{1}{\sqrt{n}}\right)^2 = (.05)^2$$

$$\frac{1}{n} = \frac{(.05)^2}{1} \xrightarrow{\text{cross multiply}} n = \frac{1}{(.05)^2} = 400$$

A survey of 1600 people in a city shows that 620 would vote for raising taxes to pay for better police and fire departments. Round answers to the nearest tenth.

a) Find the sample proportion. $\frac{620}{1600} \Rightarrow 38.8\%$

b) Find the margin of error. $\frac{1}{\sqrt{1600}} \Rightarrow \pm 2.5\%$

c) Find the interval of percents that would contain the actual population proportion. 36.3% TO 41.3%

d) If the population of the city is 148,000 find the range of citizens that would approve of rasing taxes to have a better police and fire dept.

(.363)(148,000) TO (.413)(148,000)

53,724 TO 61,124

A sample of 50 yogurt containers is taken off the production line and tested. 3 are found to have traces of E-coli.
Round to the nearest tenth.

1. Find the sample proportion. $\frac{3}{50} = 6\%$

2. Find the margin of error. $\frac{1}{\sqrt{50}} = 14.1\%$

3. If the manufacturer produces 3200 containers of yogurt a day how many of those will probably have traces of E-coli?

0% TO 20.1% → 0 TO 643

A poll conducted shows that 49% of the households surveyed watched the Super Bowl. The margin of error was ±8%.

1. Find the number households that were in the survey. $\frac{1}{\sqrt{n}} = .08 \longrightarrow n = \frac{1}{(.08)^2} = 156$

2. How would the margin of error change if the number of households surveyed were quadrupled?

$\frac{1}{\sqrt{4 \cdot 156}} \Rightarrow 4\% \rightarrow$ ½ as big

How is the margin of error affected if you double the sample size?

original: $\frac{1}{\sqrt{n}}$

double sample size (2n): $\frac{1}{\sqrt{2n}} = \frac{1}{\sqrt{2}\cdot\sqrt{n}}$

$= \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{n}}$

$= 0.71$ (original)

after doubling the sample size the margin of error is only 71% as big as the original margin of error.

In a poll of 800 registered voters Mondale received 352 votes and Carter received 336 votes.

1. Find the sample proportion for each candidate rounded to the nearest tenth.

Mondale: $\frac{352}{800} = 44\%$ Carter: $\frac{336}{800} = 42\%$

2. Find the margin of error rounded to the nearest tenth.

$\frac{1}{\sqrt{800}} \Rightarrow \pm 3.5\%$

3. Find the range of values for each candidate that likely contains their population proportion.

Mondale: 40.5 TO 47.5 Carter: 38.5 TO 45.5

Should Mondale be confident that he has the election won?

Mondale: 40.5% to 47.5%

Carter: 38.5% to 45.5%

No.
Mondale could lose If he ends up on the lower end of his predicted range and Carter ends up on the upper end of his predicted range. This race wold be considered a statistical dead heat.

You can now finish: Hwk #20

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