

Statistics – Sampling and Margin of Error

- **sampling (in statistics)** → polling a _____ which is intended to show what the whole is like
- random sampling – every possible sample of size n has an _____ of being selected (IDEAL)
 - biased sampling – some possible samples of size n may have a _____ for an specific outcome
 - voluntary sampling – possible samples of size n _____ whether or not they will participate
 - convenient sampling – most possible samples of size n are selected because they're _____

Example 1: Random samples are ideal. Determine if each method produces a true random sample.

- asking every tenth person coming out of a health club how many times a week they exercise to determine how often people in the city exercise
- surveying people going into an Italian restaurant to find out people's favorite type of food
- the government sending a tax survey to everyone whose social security number ends in a particular digit
- surveying students in a honors chemistry classes to determine the average time students in your school study each week
- putting names of all seniors in a hat, then drawing names from the hat to select a sample of seniors

- **margin of (sampling) error (ME)** → represents a _____ on the difference between how a _____ and how the _____

Margin of Error (ME) “Formula” → If the percent of people in a sampling respond in a certain way is p and the size of the sample n , then _____ of the time, the percent of the population responding in that same way will be between _____ and _____, where $ME =$ _____

Example 2: Find the margin of error (ME) where round it to the nearest percent.

a.) $p = 72\%$ and $n = 100$	b.) $p = 31\%$ and $n = 500$
c.) In a survey of 1000 randomly selected adults, 37% answered “yes” to a particular question.	d.) In a survey of 520 randomly-selected high school students, 68% of those surveyed stated that they were involved in extracurricular activities.

Example 3: Find the number of people surveyed in each situation.

a.) $p = 67\%$ and $ME = 2\%$	b.) In a recent Gallup Poll, 25% of the people surveyed said they had smoked cigarettes in the past week. The margin of error was 3%
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Example 4: Find the percent of people surveyed who said “yes” in each situation.

a.) $n = 1000$ and $ME = 3\%$	b.) According to a survey in American Demographics, 283 Americans age 12 or older said they listen to the radio every day. The survey had a margin of error of 5%.
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