

Key

I. Determine the margin of error (MOE) to the nearest percent. Must show your work!!

1.) $p = 26\%, n = 100$ $MOE = 2\sqrt{\frac{.26(1-.26)}{100}}$ $MOE = .0877$ $MOE = 8.8\%$	2.) $p = 49\%, n = 1500$ $MOE = 2\sqrt{\frac{.49(1-.49)}{1500}}$ $MOE = .0258$ $MOE = 2.6\%$	3.) $p = 96\%, n = 1000$ $MOE = 2\sqrt{\frac{.96(1-.96)}{1000}}$ $MOE = .0124$ $MOE = 1.2\%$	4.) $p = 75\%, n = 500$ $MOE = 2\sqrt{\frac{.75(1-.75)}{500}}$ $MOE = .0387$ $MOE = 3.9\%$
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II. Complete each problem. Must show your work!!

5.) A poll asked people to name the most serious problem facing the country. Forty-six percent of the 800 randomly selected people said "crime". What is the margin of error? $MOE = 2\sqrt{\frac{.46(1-.46)}{800}}$ $MOE = .03524$ $MOE = 3.5\%$	6.) According to a poll of teenagers, 43% said that they use a personal computer at home. If the margin of error is 4%, how many teenagers were polled? $.04 = 2\sqrt{\frac{.43(1-.43)}{n}}$ $(.02)^2 = \left(\sqrt{\frac{.2451}{n}}\right)^2$ $4 \times 10^{-4} = \frac{.2451}{n}$ $4 \times 10^{-4}n = .2451$ $n = \frac{.2451}{4 \times 10^{-4}} \rightarrow n = 612$ people surveyed
7.) One hundred people were asked a yes-or-no question in an opinion poll. How many said "yes" if the margin of error was 9.6%? $.096 = 2\sqrt{\frac{p(1-p)}{100}}$ $(.048)^2 = \left(\sqrt{\frac{p-p^2}{100}}\right)^2$ $.002304 = \frac{p-p^2}{100}$ $p - p^2 - .02304 = 0$ $p = 36\%$ or $p = 64\%$ said yes	8.) Three-hundred sixty-seven of the 425 high school students said pizza was the favorite food in the school cafeteria. What is the margin of error? $\frac{367}{425} = 86\% = p$ $MOE = 2\sqrt{\frac{.86(1-.86)}{425}}$ $MOE = .03366$ $MOE = \text{about } 3.4\%$
9.) A study by the University of Illinois in 1995 showed an increase in productivity by 10% of the employees who wore headsets and listened to music of their choice while they were working. The margin of error for the study was about 7%. How many employees participated in the study? $.07 = 2\sqrt{\frac{.1(1-.1)}{n}}$ $(.035)^2 = \left(\sqrt{\frac{.09}{n}}\right)^2$ $.001225 = \frac{.09}{n}$ $n = \frac{.09}{.001225} = 73$ ppl surveyed	10.) In a poll conducted by ABC news, 1,020 people surveyed and asked if they supported raising the minimum wage. How many people said they support minimum wage if the ME = 2.4%? $.024 = 2\sqrt{\frac{p(1-p)}{1020}}$ $(.012)^2 = \left(\sqrt{\frac{p-p^2}{1020}}\right)^2$ $1.44 \times 10^{-4} = \frac{p-p^2}{1020}$ $p - p^2 - .000144 = 0$ $p = 18\%$ or $p = 82\%$ of ppl supported min wage
11.) According to a Gallup Poll, 33% of shoppers planned to spend \$1000 or more during a recent holiday season. The margin of error was 3%. How many people were surveyed? $.03 = 2\sqrt{\frac{.33(1-.33)}{n}}$ $(.015)^2 = \left(\sqrt{\frac{.2211}{n}}\right)^2$ $2.25 \times 10^{-4} = \frac{.2211}{n}$ $n = \frac{.2211}{2.25 \times 10^{-4}} = 982$ ppl were surveyed	12.) In a recent Harris poll, 1,010 people were surveyed said they considered being a physician to be a very prestigious occupation. How many people said that the a physician was prestigious if the margin of error is 3.1%? $.031 = 2\sqrt{\frac{p(1-p)}{1010}}$ $(.0155)^2 = \left(\sqrt{\frac{p-p^2}{1010}}\right)^2$ $2.4025 \times 10^{-4} = \frac{p-p^2}{1010}$ $p - p^2 - .00024025 = 0$ $p = 41\%$ or $p = 59\%$ of ppl said was a prestigious occupation