

Help can be found in class lecture, topics review or related PowerPoints

Remark: This practice quiz only focus on estimating population proportion but to be ready for quiz 9 you need to review quiz # 8 one more time.

- a) What do we estimate? Population percentage (P) or sample mean (\hat{P}) or both?
- b) What is the point estimate?
- c) What is the confidence level?
- d) What is the margin of error formula for estimation population proportion?
- e) What is the width of a confidence interval?
- f) How we can use the upper and lower boundaries of a confidence interval to find point estimate?
- g) How we can use the width of a confidence interval to find margin of error?

YouTube TI Calculator: <https://www.youtube.com/watch?v=OVc5BCa0UvQ> General introduction

YouTube TI Calculator: <https://www.youtube.com/watch?v=e3HZ6Xv-plk> General introduction

Find the margin of error for the following problems?

$$P = \hat{p} \pm E \qquad E = z_{\alpha/2} \left(\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \right)$$

Fill in the blanks with one of the following: *increases, decreases, or stays the same* where.

- a) As the sample size (n) increases, the margin of error (E) _____.
- b) As the confidence level (C) increases, the margin of error (E) _____.

- 1) In a Roper poll of 3000 working men, 56% said “they feel guilty that they don’t spend more time with their families.” Construct a 98% confidence interval for the proportion of all working men who hold this view.

$$E = \qquad P = \qquad 53.89\% < P < 58.11\%$$

- 2) In a *Time/CNN* telephone poll of 1012 adult Americans, 11% of the respondents said that Ronald Regan was a great president. Give a 98% confidence interval for the proportion of all adult Americans who think that Regan was a great president.

$$E = \qquad P = \qquad 8.71\% < P < 13.29\%$$

- 3) The paralyzed Veterans of America is a philanthropic organization that relies on contributions. They send free mailing labels and greeting cards to potential donors on their list and ask for voluntary contribution. To test a new campaign they recently sent letters to a random sample of 100,000 potential donors and received 4781 donations.

- a) Give a 95% confidence interval for the true proportion of those from their entire mailing list who may donate.

$$E = \qquad P = \qquad 4.65\% < P < 4.91\%$$

- b) A staff member thinks that the true rate is 5%. Given the confidence interval you found, do you find that percentage plausible?

4) A national health organization warns that 30% of the middle school students nationwide have been drunk. Concerned, a local health agency randomly and anonymously surveys 110 of the middle 1212 middle school students in its city. Only 21 of them report having been drunk.

- a) What proportion of the sample reported having been drunk?
 - b) Does this mean that this city's youth are not drinking as much as the national data would indicate?
 - c) Create a 95% confidence interval for the proportion of the city's middle school students who have been drunk. $11.78\% < P < 26.22\%$
 - d) Is there any reason to believe that the national level of 30% is not true of the middle school students in the city?
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5) In a poll taken in March of 2007, Gallup asked 1006 national adults whether they were baseball fans. 36% said they were. A year previously 37% of a smaller size sample had reported being baseball fans.

- a) Find the margin of error for the 2007 poll if we want 90% confidence in our estimate of the percent of national adults who are baseball fans.
 - b) Explain what the margin of error means. **In a confidence interval, the range of values above and below the sample statistic is called the *margin of error***
 - c) If we wanted to be 99% confident, would the margin of error be larger or smaller?
 - d) Find the margin of error for 99% confidence level.
 - e) In general, all other aspects of the situation remain the same; will smaller margins of error produce greater or less confidence in the interval?
 - f) Do you think there's been a change from 2006 to 2007 in the real proportion of national adults who are baseball fans?
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6) Several factors are involved in the creation of a confidence interval. Among them are the sample size, the level of confidence, and the margin of error. Which statements are true?

- a) For a given sample size, higher confidence means a smaller margin of error.
 - b) For a specified confidence level, larger samples provide smaller margins of error.
 - c) For a fixed margin of error, larger samples provide a greater confidence.
 - d) For a given confidence level, halving the margin of error requires a sample twice as large.
 - e) For a given sample size reducing the margin of error will mean lower confidence.
 - f) For a certain confidence level, you can get a smaller margin of error by selecting a bigger sample.
 - g) For a fixed margin of error, smaller samples will mean lower confidence.
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7) Given the estimated proportion of a population as $40\% < P < 68\%$, Find $\hat{p} = 54\%$ and $E = 14\%$

8) Given the estimated proportion of a population as $(21\%, 69\%)$, Find $\hat{p} = 45\%$ and $E = 24\%$