

Let  $p_{<40k}$  be the proportion of people who feel personally affected by US government shutdowns among the people making less than \$40,000 per year, and let  $p_{\geq 40k}$  be the proportion of people who feel personally affected by US government shutdowns among the people making at least \$40,000 per year. Based on the results of a poll, a 95% confidence interval for  $p_{<40k} - p_{\geq 40k}$  was found to be  $(-0.16, 0.02)$ .

1. True or False?

A 95% confidence interval for  $p_{\geq 40k} - p_{<40k}$  is  $(-0.02, 0.16)$ .

Let  $p_{<40k}$  be the proportion of people who feel personally affected by US government shutdowns among the people making less than \$40,000 per year, and let  $p_{\geq 40k}$  be the proportion of people who feel personally affected by US government shutdowns among the people making at least \$40,000 per year. Based on the results of a poll, a 95% confidence interval for  $p_{<40k} - p_{\geq 40k}$  was found to be  $(-0.16, 0.02)$ .

2. True or False?

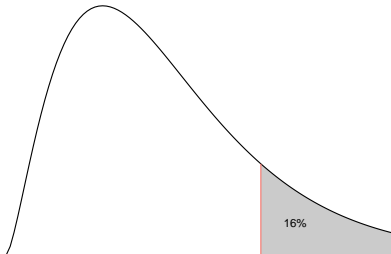
Among poll respondents, more people in the wealthier income group felt personally affected by US government shutdowns.

3. Which of the following is true about a chi-squared distribution?

- (A) It is left skewed.
- (B) It is right skewed.
- (C) It is symmetric.

4. The black curve below is a chi-square distribution with 5 degrees of freedom. Which of the following R commands would you use to calculate the x-coordinate of the pink line?

- (A) `pchisq(0.16, 5)`
- (B) `1-pchisq(0.16, 5)`
- (C) `qchisq(0.16, 5)`
- (D) None of the above.



5. How does the mean of a chi-squared distribution change as the degrees of freedom increases?

(A) The mean stays the same.

(B) The mean decreases.

(C) The mean increases.

(D) None of the above.

In the country of B, about 55% of the population speaks D as their first language, about 40% speaks F, and the remaining 5% speaks some other language as their first language. You want to test the hypothesis  $H_0$  that the national distribution of first languages matches the distribution of first languages of residents of the capital city of B, so you take a simple random sample of 50 residents of the capital city and ask each of them what their first language is.

6. Is it reasonable to conduct a chi-square test using this data to test  $H_0$ ?

(A) Yes

(B) No

You want to test the hypothesis  $H_0$  that gender identity and highest educational attainment are independent among Coloradans. You start with a simple random sample of 10 Coloradans and have them respond to a survey about their gender identity and educational attainments. Then, to each person who responds to the survey, you offer a \$50 Amazon gift card if they recruit a Coloradan friend to respond to the same survey. This process continues until you've collected responses from 10,000 Coloradans.

7. Is it reasonable to conduct a chi-square test using this data to test  $H_0$ ?

(A) Yes

(B) No

You want to test the hypothesis  $H_0$  that height and highest educational attainment are independent among Coloradans. You collect data about height and educational attainment from a simple random sample of 10,000 Coloradans.

8. Is it reasonable to conduct a chi-square test using this data to test  $H_0$ ?

(A) Yes

(B) No