Inference for proportions

1) If 64% of an SRS of 550 people leaving a shopping mall claim to have spent over \$25, determine a 99% confidence interval estimate for the proportion of shopping mall customers who spend over \$25.

2) A union spokesperson claims that 75% of union members will support a strike if their basic demands are not met. A company negotiator believes the true percentage is lower and runs a hypothesis test at the 10% significance level. What is the conclusion if 87 out of an SRS of 125 union members say they will strike?

3) A U.S. Department of Labor survey of 6230 unemployed adults classified people by marital status, gender, and race. The raw numbers are as follows:

White, 16 yr and older			
	Married	Widow/Div.	Single
Men	1090	337	1168
Women	952	423	632

Nonwhite, 16 yr and older			
	Married	Widow/Div.	Single
Men	266	135	503
Women	189	186	349

a. Find a 90% confidence interval estimate for the proportion of unemployed men who are married.

4) An Environmental Protection Agency (EPA) investigator wants to know the proportion of fish that are inedible because of chemical pollution downstream of an offending factory. If the answer must be within ±.03 at the 96% confidence level, how many fish should be in the sample tested?

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1) Changing from a 95% confidence interval estimate for a population proportion to a 99% confidence interval estimate, with all other things being equal,

(A) increases the interval size by 4%.
(B) decreases the interval size by 4%.
(C) increases the interval size by 31%.
(D) decreases the interval size by 31%.
(E) This question cannot be answered without knowing the sample size.

2) A *USA Today* "Lifeline" column reported that in a survey of 500 people, 39% said they watch their bread while it's being toasted. Establish a 90% confidence interval estimate for the proportion of people who watch their bread being toasted.

(A) $.39 \pm \sqrt{\frac{(.39)(.61)}{500}}$

(B) $.39 \pm 1.645\left(\frac{.39}{\sqrt{500}}\right)$

(C) $.39 \pm 1.96\left(\frac{\sqrt{(.39)(.61)}}{500}\right)$

(D) $.39 \pm 1.645\sqrt{\frac{(.39)(.61)}{500}}$

(E) $.39 \pm 1.96\sqrt{\frac{(.39)(.61)}{500}}$

3) A survey was conducted to determine the percentage of high school students who planned to go to college. The results were stated as 82% with a margin of error of ±5%. What is meant by ±5%?

(A) Five percent of the population were not surveyed.
(B) In the sample, the percentage of students who plan to go to college was between 77% and 87%.
(C) The percentage of the entire population of students who plan to go to college is between 77% and 87%.
(D) It is unlikely that the given sample proportion result would be obtained unless the true percentage was between 77% and 87%.
(E) Between 77% and 87% of the population were surveyed.

4) A politician wants to know what percentage of the voters support her position on the issue of forced busing for integration. What size voter sample should be obtained to determine with 90% confidence the support level to within 4%?

(A) 21
(B) 25
(C) 423
(D) 600
(E) 1691

5) . In a survey funded by Burroughs-Welcome, 750 of 1000 adult Americans said they didn't believe they could come down with a sexually transmitted disease (STD). Construct a 95% confidence interval estimate of the proportion of adult Americans who don't believe they can contract an STD.

(A) (.728, .772)
(B) (.723, .777)
(C) (.718, .782)
(D) (.713, .787)
(E) (.665, .835)

6) A survey of 1000 Canadians reveals that 585 believe that there is too much violence on television. In a survey of 1500 Americans, 780 believe that there is too much television violence. To test at the 5% significance level whether or not the data are significant evidence that the proportion of Canadians who believe that there is too much violence on television is not equal to the proportion of Americans who believe that there is too much violence on television, a student sets up the following: H_0: $p = .585$ and H_a: $p \neq .585$, where p is the proportion of Americans who believe there is too much violence on television. Which of the following is a true statement?

(A) The student has set up a correct hypothesis test.
(B) Given the sample sizes, a 1% significance level would be more appropriate.
(C) Given that $\frac{780}{1500} = .52$, H_a: $p < .585$ would be more appropriate.
(D) Given that $\frac{585+780}{1000+1500} = .546$, H_0: $p = .546$ would be more appropriate.
(E) A two-population difference in proportions hypothesis test would be more appropriate.

7) A building inspector believes that the percentage of new construction with serious code violations may be even greater than the previously claimed 7%. She conducts a hypothesis test on 200 new homes and finds 23 with serious code violations. Is this strong evidence against the .07 claim?

(A) Yes, because the *P*-value is .0062.
(B) Yes, because the *P*-value is 2.5.
(C) No, because the *P*-value is only .0062.
(D) No, because the *P*-value is over 2.0.
(E) No, because the *P*-value is .045.

8) In an effort to curb certain diseases, especially autoimmune (AIDS), San Francisco has a program whereby drug users can exchange used needles for fresh ones. As reported in the *Journal of the American Medical Association* (January 12, 1994, p. 115), 35% of 5644 intravenous drug users in San Francisco admitted to sharing needles. Is this sufficient evidence to say that the rate of sharing needles has dropped from the pre-needle exchange rate of 66%?

(A) $P < .001$, so this is very strong evidence that the rate has dropped.
(B) $P = .0063$, so this is strong evidence of a drop in rate.
(C) P is between .01 and .05, so there is moderate evidence of a drop in rate.
(D) P is between .05 and .10, so there is some evidence of a drop in rate.
(E) $P = .31$, so there is no real evidence of a drop in rate.