Math 373 Hw 15 Recommended problems, don't turn this in.

Hw 302: 8.44, 8.46, 8.50. 308: 8.54. Rec. 302: 8.45, 8.47, 8.51. 308: 8.53.

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8.45 Independent samples of $n_1 = 800$ and $n_2 = 640$ observations are selected from binomial populations 1 and 2 with $x_1 = 337$ and $x_2 = 374$ successes observed.
(a) Find the 90% confidence interval for the difference $(p_1 - p_2)$ in the two population proportions.

(b) What assumptions must you make for the confidence interval to be valid?

(b') Are these assumptions met?

8.47 M&M's come in plain-variety bags and peanut-variety bags. We want to determine if both varieties have the same proportion of red candies. A random sample of 56 candies from a plain bag contained 12 red candies. A sample of 32 candies from a peanut bag contained 8 red candies.
(a) Construct a 99% confidence interval for the difference $(p_1 - p_2)$ in the proportions of red candies in the plain and peanut varieties.

(b) Is there a statistically significant difference between the proportion of red candies in the plain versus the peanut varieties?

8.51 To investigate the relationship between birth order and college success, an investigator found that 126 in a sample of 180 college graduates were firstborn or only children. In a sample of 100 nongraduates of comparable age and socioeconomic background, the number of firstborn or only children was 54.
(a) Estimate the difference between the proportions of firstborn or only children in the two populations from which these samples were drawn.

(b) Find the 90% confidence interval.

(c) Is there a statistically significant result here?

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8.53 Find a 99% lower bound confidence interval for the proportion p when a random sample of $n = 400$ trials produced $x = 196$ successes.

Answers

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8.45 (a) Find the 90% confidence interval for the difference $(p_1 - p_2)$ in the two population proportions. [-.21, -.12]

(b) What assumptions must you make for the confidence interval to be valid?
random, independent samples from a binomial population

(b') Are these assumptions met? Yes

8.47 (a) Construct a 99% confidence interval for the difference $(p_1 - p_2)$ in the proportions of red candies in the plain and peanut varieties. [-.28, .21]

(b) Is there a statistically significant difference between the proportion of red candies in the plain versus the peanut varieties? no

8.51 (a) Estimate the difference between the proportions of firstborn or only children in the two populations from which these samples were drawn. .16

(b) Find the 90% confidence interval. [.061, .26]

(c) Is there a statistically significant result here? yes

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8.53 Find a 99% lower bound confidence interval for the proportion p when a random sample of $n = 400$ trials produced $x = 196$ successes.
With 99% confidence: $p \in [.49 - (2.33)(.024), \infty) = [.43, \infty)$