

CP Statistics Chapter 10 Practice Free Response Test

Show all work for the following on the answer sheet. Answer completely and clearly.

1. A survey was conducted by the Ventura County Start to estimate the percentage of adult county residents who would support a state prison built in the county. A confidence interval from the results was determined to be 13.2% to 17.8%.

- (a) What is the margin of error for this confidence interval?
 - (b) What percentage of the residents surveyed said they support building a prison here?
 - (c) If 1200 adults were surveyed, how many said they support a prison in Ventura County?
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2. An insurance company checks police records on 582 accidents, selected at random, and notes that teenagers were at the wheel in 91 of them.

- (a) What is the sample proportion of teen drivers in these accidents?
 - (b) Construct a 99% confidence interval for this survey.
 - (c) Interpret the interval computed in part (b) in a complete sentence.
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3. Students investigating the packaging of potato chips purchased 6 bags of *Ruffles* potato chips marked with a net weight of 28.3 grams. They carefully weighed the contents of each bag and recorded the following weights (in grams).

| | | | | | |
|------|------|------|------|------|------|
| 29.3 | 28.2 | 29.1 | 28.7 | 28.9 | 28.5 |
|------|------|------|------|------|------|

- (a) Construct a 95% confidence interval for the true mean weight of the Ruffles potato chip bags used in the investigation.
- (b) Interpret the interval computed in part (a) in a complete sentence.
- (c) Does the interval from part (a) give you reason to suspect that the potato chip bags do not weigh the 28.3 grams that are advertised? Explain.

CP Statistics Chapter 10 Practice Free Response Test - SOLUTIONS

1. A survey was conducted by the Ventura County Start to estimate the percentage of adult county residents who would support a state prison built in the county. A confidence interval from the results was determined to be 13.2% to 17.8%.

(a) $\frac{17.8-13.2}{2} = \frac{4.6}{2} = \mathbf{2.3\%}$

(b) $\frac{17.8+13.2}{2} = \frac{31}{2} = \mathbf{15.5\%}$

- (c) 15.5% of 1200 = .155(1200) = **186**. So 186 of the 1200 people surveyed stated that they support a prison in Ventura County.
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2. An insurance company checks police records on 582 accidents, selected at random, and notes that teenagers were at the wheel in 91 of them.

(a) $\hat{p} = \frac{91}{582} = .156$. So 15.6% of the accidents examined involved teenage drivers.

- (b) A proportions interval is of the form $\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ For 99% confidence, $z^* = 2.576$.

So the interval is $.156 \pm 2.576 \sqrt{\frac{.156(.844)}{582}} = .156 \pm .039 = .117 \text{ to } .195$.

- (c) We are 99% confident that the true percentage of car accidents involving teenage drivers is between 11.7% and 19.5%.
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3. Students investigating the packaging of potato chips purchased 6 bags of *Ruffles* potato chips marked with a net weight of 28.3 grams. They carefully weighed the contents of each bag and recorded the following weights (in grams).

| | | | | | |
|------|------|------|------|------|------|
| 29.3 | 28.2 | 29.1 | 28.7 | 28.9 | 28.5 |
|------|------|------|------|------|------|

| |
|------------------------------|
| $\bar{x} = 28.783, s = .402$ |
|------------------------------|

- (a) A means interval is of the form $\bar{x} \pm t^* \frac{s}{\sqrt{n}}$ For C=95% and df=5, $t^* = 2.571$.

So the interval is $28.783 \pm 2.571 \frac{.402}{\sqrt{6}} = 28.783 \pm .422 = 28.361 \text{ to } 29.205$.

- (b) We are 95% confident that the true mean weight of these Ruffles potato chip bags is between 28.361 grams and 29.205 grams.

- (c) Since the low end of the interval (28.361) is a little higher than the advertised weight of 28.3 grams, it appears that these bags weigh more than they are supposed to.