AP Statistics
Review Ch 19-22

Below are three INFERENCE procedures. Your job is to cut out, find and match all the required steps on the next two pages. If you have matched the steps correctly, you will have a textbook perfect hypothesis test or confidence interval.

1. A random sample of 380 houses in Berrien County, Michigan was surveyed about electronic burglar alarm systems. 102 houses responded they do have an electronic burglar alarm system. Construct a 90% Conf Interval for the proportion of houses with a burglar alarm.

2. A nutritionist is studying the levels of sodium in snack foods and has drawn random samples of one ounce of plain potato chips and flavored potato chips. She compares the sample sodium level with the value on the nutrition label.

Does a smaller proportion of plain chips exceed the nutrition label than flavored chips? alpha = 0.05.

Type	Number Exceeding Nutrition Label	Sample Size
Plain	25	155
Flavored	36	161

3. A nutritionist is studying the levels of sodium in snack foods and has drawn random samples of one ounce of plain potato chips. She compares the sample sodium level with the value on the nutrition label.

Do 10% of plain chips exceed the nutrition labels? Use alpha = 0.05.

Type	Number Exceeding Nutrition Label	Sample Size
Plain	25	155

2 Difference of Two proportion Z-test

1 90% Confidence Interval for true proportion

3 One proportion Z-test

1 Random – told in problem statement

2 Random – told in problem statement

3 Random – told in problem statement

1 Independent – No reason not to believe

2 Independent – No reason not to believe

3 Independent – No reason not to believe

2 The two samples n_1 and n_2 are independent from each other.

2 n < 10% of population , yes, more than 1550 and 1610 ounces of potato chips

1 n < 10% of population , yes, more than 3800 houses in the county

3 n < 10% of population , yes, more than 1550 ounces of potato chips

1 Sample large enough to assume approx normal $n\hat{p} \geq 10 \quad n(1-\hat{p}) \geq 10$

2 Sample large enough to assume approx normal $n_f\hat{p}_f \geq 10 \quad n_f(1-\hat{p}_f) \geq 10$
$n_p\hat{p}_p \geq 10 \quad n_p(1-\hat{p}_p) \geq 10$

3 Sample large enough to assume approx normal $n_1\pi_1 \geq 10 \quad n_1(1-\pi_1) \geq 10$

1 The method used to to construct 90% of the intervals of size 380 will contain the true proportion of homes in Berrien County that have burglar alarms in the interval (.231, .305)

2 There is no reason to believe flavored exceed the nutrition labels more than plain.

3 The true proportion of chips that exceed nutrition labels is greater than 10%.

1 $\hat{p} \mp (1.645)\left(\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}\right)$

1 $.268 \mp (1.645)\left(\sqrt{\frac{.268(1-.268)}{380}}\right)$

2 $z = \frac{(\widehat{p_f} - \widehat{p_p}) - hypvalue}{\sqrt{\frac{p_c(1-p_c)}{n_1} + \frac{p_c(1-p_c)}{n_2}}}$

3 $z = \frac{(\hat{p}) - hypvalue}{\sqrt{\frac{\pi(1-\pi)}{n}}}$

2 $\widehat{p_p} = .161$

2 $\widehat{p_f} = .223$

2 $\widehat{p_c} = .193$

1 $\hat{p} = .268$

1 (,231, .305)

3 $\hat{p} = .161$

2 z = -1.403

3 z = 2.54

2 Fail to Reject Ho.

2 pvalue = .080

3 pvalue = .005

3 Reject Ho.

2 Ho: $\pi_f - \pi_p = 0$ Ha: $\pi_f - \pi_p > 0$

3 Ho: $\pi = 0.1$ Ha: $\pi > 0.1$