

Table Number: \_\_\_\_\_

Group Name: \_\_\_\_\_

Group Members: \_\_\_\_\_

## Hypothesis Testing for Proportions

1. A 2003 study of dreaming found that out of a random sample of 113 people, 92 reported dreaming in color. However the rate of reported dreaming in color that was established in the 1940s was 0.29. Check to see whether the conditions for using a one-proportion z-test are met assuming the researcher wanted to test to see if the proportion dreaming in color had changed since the 1940's.
  
2. Suppose you are testing the claim that a coin comes up tails more than 50% of the time when the coin is spun on a hard surface. Steps 1 and 2 of the hypothesis test are given. Suppose that you did this experiment and got 22 tails in 30 spins. Find the value of the test statistic  $z$  and the corresponding  $p$ -value.

$p$  is the proportion of tails.

STEP 1:  $H_0 : p = 0.50$   
 $H_a : p > 0.50$

STEP 2: Assume that the outcomes are random and the sample size is large enough because both  $np$  and  $n(1-p)$  are both 15.

$z$ - statistic (SHOW WORK!!) \_\_\_\_\_

$p$ -value: \_\_\_\_\_ (Use graphing calculator)

### SKILL AND DRILL

In problems #3 - #8, test the hypotheses. Find the  $p$ -value and indicate whether the researcher should reject or not reject the null hypothesis. Please note that not all significance levels are 0.05.

3.  $H_0 : p = 0.3$   
 $H_a : p > 0.3$

$n = 200$ ;  $x = 75$ ;  $\alpha = 0.05$

$p$ -value: \_\_\_\_\_

Circle one: REJECT  $H_0$    DO NOT REJECT  $H_0$

4.  $H_0 : p = 0.6$   
 $H_a : p < 0.6$

$n = 250; x = 124; \alpha = 0.01$

p-value: \_\_\_\_\_

Circle one: REJECT  $H_0$     DO NOT REJECT  $H_0$

5.  $H_0 : p = 0.55$   
 $H_a : p < 0.55$

$n = 150; x = 78; \alpha = 0.1$

p-value: \_\_\_\_\_

Circle one: REJECT  $H_0$     DO NOT REJECT  $H_0$

6.  $H_0 : p = 0.25$   
 $H_a : p < 0.25$

$n = 400; x = 96; \alpha = 0.1$

p-value: \_\_\_\_\_

Circle one: REJECT  $H_0$     DO NOT REJECT  $H_0$

7.  $H_0 : p = 0.9$   
 $H_a : p \neq 0.9$

$n = 500; x = 440; \alpha = 0.05$

p-value: \_\_\_\_\_

Circle one: REJECT  $H_0$     DO NOT REJECT  $H_0$

8.  $H_0 : p = 0.4$   
 $H_a : p \neq 0.4$

$n = 1000; x = 420; \alpha = 0.01$

p-value: \_\_\_\_\_

Circle one: REJECT  $H_0$     DO NOT REJECT  $H_0$

9. In a 2010 poll of 1000 adults, 520 of those polled said that schools should ban all junk food from vending machines in schools. Do a majority of adults (more than 50%) support a ban on junk food? Perform a hypothesis test using a significance level of 0.05. (See p. 342 in your text for all the steps.)

STEP 1

$H_0 :$

$H_a :$

STEP 2

STEP 3

STEP 4: (Circle one) REJECT  $H_0$                       DO NOT REJECT  $H_0$

Choose the best interpretation of the results you obtained in STEP 4:

- I.    The percentage of all adults who favor banning is significantly more than 50%
  
- II.   The percentage of all adults who favor banning is not significantly more than 50%