MAT 223, Paper Quiz #8, Spring 2017   Name ___KEY___

Instructions: Show all work. Use exact answers unless specifically asked to round. Explain thoroughly using complete sentences.

1. Blood glucose levels for obese patients have a mean of 100 with a standard deviation of 15. A researcher thinks that a diet high in raw cornstarch will change blood glucose levels. A sample of 30 patients who have tried the raw cornstarch diet have a mean glucose level of 140. Test the hypothesis that the raw cornstarch had an effect.

Z-Test Stats

$\mu_0 = 100$ $\mu \ne \mu_0$ $H_0: \mu = 100$
$\sigma = 15$ $H_a: \mu \ne 100$ (change)
$\bar{x} = 140$ $Z = 14.6$
$n = 30$ $P = 2.695 \times 10^{-48} << .05$
                                        reject H_0

yes, this is strong evidence that this diet changes blood sugar levels

2. A faster loan processing time produces higher productivity and greater customer satisfaction. A financial services institution wants to establish a baseline for their process by estimating their mean processing time. They also want to determine if their mean time differs from a competitor's claim of 6 hours. A financial analyst randomly selects 7 loan applications and manually calculates the time between loan initiation and when the customer receives the institution's decision. The statistics indicate that the sample mean is 5.079 hours, and the standard deviation of the sample data is 1.319 hours. Is this sufficient evidence to conclude their processing time is faster than their competitor?

$H_0: \mu = 6$ $S_x = 1.319$ $t = -1.847$
$H_a: \mu < 6$ $n = 7$ $P = .057... > .05$
T-Test Stats $\mu < \mu_0$ fail to reject H_0
$\mu_0 = 6$
$\bar{x} = 5.079$ no, this is not sufficient evidence that their processing time is faster.

3. Are more than 80% of Americans right handed? In a sample of 100 Americans, 87 were right handed. Determine if this is sufficient evidence to conclude that more than 80% of American are, indeed, right-handed.

1 PropZTest $H_0: p = .8$ $Z = 1.75$
                    $H_a: p > .8$ $P = .0400... < .05$
$p_0 = .8$ reject H_0.   yes. this is sufficient
$x = 87$ evidence to think more
$n = 100$ than 80% of Americans
prop $> p_0$ are right handed.