MAT 223, Quiz #14, Fall 2015 Name KEY

Instructions: Show all work. If you use your calculator, give calculator commands used. Use exact answers, or round appropriately. Answer all parts of each question.

1. A sample of 1500 was asked if they liked math. Only 37% of them agreed. Is this good evidence to suggest that less than half the population likes math?

1 Prop Z Test

$H_0: p = .5$

$H_a: p < .5$

$p_0 = .5$

$x = 1500 * .37 = 555$

$n = 1500$

Prop < p_0

$z = -10.0697...$

$p = 0 < .05$ reject H_0

yes, there is good reason to think less than half the population likes math.

2. Would your conclusions still hold for a sample of 15 people?

1 Prop Z Test

$H_0: p = .5$

$H_a: p < .5$

$p_0 = .5$

$X = 15 * .37 = 5.55 \rightarrow$ must be either 5 or 6

$n = 15$

with $x = 6$

$z = -.77459...$

$p = .219288$

w/ $x = 5$

$z = -1.2909...$

$p = .09835...$

in both cases, P-value > .05 so fail to reject H_0

this would not be good evidence to think less than half the population likes math.

3. A certain class of 85 students is found to have a mean IQ score of 105.7. Assuming a population mean of 100 with a standard deviation of 15, is this sufficient evidence to conclude that the mean IQ of this groups of students is significantly different than the general population?

Z-Test (Stats)

$H_0: \mu = 100$

$H_a: \mu \neq 100$

$\mu_0 = 100$

$\sigma = 15$

$\bar{x} = 105.7$

$n = 85$

$\mu \neq \mu_0$

$z = 3.544...$

$p = 3.93... \times 10^{-4} < .05$

reject H_0

there is good reason to think that this group of students does have a higher IQ than the general population.