

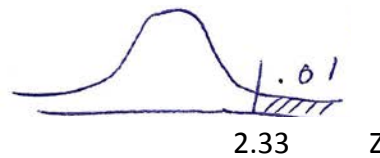
SOLUTIONS TO

TEST YOUR KNOWLEDGE: Proportions

1. Dr. Dexter Morgan, prominent high school principal, claims that no more than 10% of graduates from his school would fail a standardized reading test for high school graduates. A researcher randomly administers the test to 150 graduates from Dr. Morgan's high school and finds that 27 failed. Test at the .01 significance level (alpha).

- (a) What are the null and alternate hypotheses?
- (b) Draw the picture of the distribution of the test statistic (under H_0). Include critical value(s) and region(s) of rejection.
- (c) What is the calculated (computed) value of the test statistic?
- (d) What is your conclusion?

$H_0: P \leq .10$
 $H_1: P > .10$



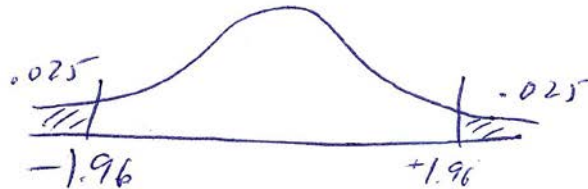
$p_s = 27/150 = .18$

$$Z = \frac{.18 - .10}{\sqrt{\frac{(.10)(.90)}{150}}} = \frac{.08}{\sqrt{.0006}} = 3.27 \quad \text{reject } H_0$$

2. A researcher is interested in measuring the proportion of people residing in the Catskill Mountain region of New York State that are in favor of legalizing marijuana. She randomly samples 200 adults and finds that 170 are in favor of making marijuana legal.

- (a) Using the above data, construct a 95% CIE for the legalization of marijuana.

$p_s = \frac{170}{200} = .85$



$$.85 \pm 1.96 \left(\sqrt{\frac{(.85)(.15)}{200}} \right)$$

$.049 = .05$

80% \longleftrightarrow 90%