Name Jerry

Student Number _____

STA 312f2012 Quiz 1

$$Z_1 = \frac{\sqrt{n}(p-\pi_0)}{\sqrt{\pi_0(1-\pi_0)}} \qquad Z_2 = \frac{\sqrt{n}(p-\pi_0)}{\sqrt{p(1-p)}}$$

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> qnorm(0.975)
[1] 1.959964
> qnorm(0.995)
[1] 2.575829
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1. (2 points) Students seeking extra help in a large math class were randomly assigned to receive one of three tutoring methods. Whether they passed the course (Yes-No) was recorded. Identify the explanatory variable and the response variable.

Explanatory variable is tutoring method.
Response variable is passed or not.

2. (8 points) In a risky type of brain surgery, seventy-five percent of patients survive for at least 24 hours after the surgery. But at a hospital that usually achieves this success rate, 15 out of the last 30 patients have died. Could this be due to chance?

   (a) Calculate a reasonable test statistic. Show your work. The final answer is a single number. **Circle the number.**

$$Z_1 = \frac{\sqrt{30}\left(\frac{1}{2} - \frac{3}{4}\right)}{\sqrt{\frac{3}{4}\left(1-\frac{3}{4}\right)}} = \frac{-1.369}{0.433} = -3.16$$

or

$$Z_2 = \frac{\sqrt{30}\left(\frac{1}{2} - \frac{3}{4}\right)}{\sqrt{\frac{1}{2}\left(1-\frac{1}{2}\right)}} = \frac{-1.369}{0.50} = -2.74$$

Either one is okay.

(b) What are the critical values at $\alpha = 0.05$ for a 2-sided test? The answer is a *pair* of numbers.

± 1.96

(c) Do you reject H_0? Answer Yes or No. Yes

(d) State your conclusion in plain, non-statistical language. You have a lot more room than you need.

Recently, patients are more likely to die than usual.