Stat 2470, Quiz #13, Fall 2014 Name KEY

Instructions: Show all work. Use exact answers or appropriate rounding conventions. If you use your calculator, you can show work by saying which calculator commands you used.

1. It is known that roughly 2/3 of all human beings have a dominant right foot or eye. Is there also right-dominance in kissing? An article reported that a random sample of 124 kissing couples, both people in 80% of the couples tended to lean more to the right than to the left.
   a. If 2/3 of all kissing couples exhibit this right-leaning behaviour, what is the probability that the number in a sample of 124 who do so differs from the expected value by at least as much of what was actually observed?

$$z = \left| \frac{2/3 - .8}{\sqrt{\frac{2/3 \cdot 1/3}{124}}} \right| = 3.1496$$

normalcdf(3.1496, E99) $= 8.775 \times 10^{-4} = .08\%$ x2 $.16\%$

   b. Does the result of the experiment suggest that the 2/3 figure is implausible for kissing? State and test the appropriate hypothesis.

$H_0: p = 2/3$ or $p \leq 2/3$

$H_a: p \neq 2/3$

$x = 99$

$n = 124$

$z = 3.1115$

$p = .00186$

reject Ho. Seems unlikely. probably higher.

2. Find the P-value of a hypothesis test for each of the stated conditions. Would you reject the null hypothesis at the 0.05 significance level?
   a. $z = 1.42$, two-tailed 2·normalcdf(1.42, E99) $= .1556$ fail to reject
   b. $z = 2.48$, one-tailed normalcdf(2.48, E99) $= .006569$ fail to reject
   c. $df = 8, t = -2.0$, lower-tailed tcdf(−E99, −2.0, 8) $= .040258$ reject Ho
   d. $n = 20, t = 4.8$, two-tailed 2·tcdf(4.8, E99, 19) $= 1.2946 \times 10^{-4}$ reject Ho

3. Is there any systematic tendency for part-time college faculty to hold their students to different standards than do full-time faculty? An article reported that for a sample of 125 courses taught by full-time faculty, the mean course GPA was 2.7186, and the standard deviation was 0.63342; whereas for part-time faculty, a sample of 88 courses the mean and standard deviation were 2.8639 and 0.49241 respectively. Does it appear that the true average course GPA for part-time faculty differs from that for full-time faculty? Test the appropriate hypothesis and state the P-value along with your conclusion.

$H_0: \mu_1 - \mu_2 = 0$ or $\mu_1 = \mu_2$

$H_a: \mu_1 - \mu_2 \neq 0$ or $\mu_1 \neq \mu_2$

2 sample T-test

$\bar{x}_1 = 2.7186$
$s_1 = .63392$
$n_1 = 125$
$\bar{x}_2 = 2.8639$
$s_2 = .49241$
$n_2 = 88$
not pooled

$\Rightarrow$ $t = -1.88$
$p = .0613$

fail to reject H_0
part-timers appears to hold students to the same standards as full-time faculty (or there is not enough evidence to conclude that they do)