

Quiz 5 for Statistics 301
Elementary Statistical Methods - Spring 2001
Material Covered: Section 9.4 of Workbook and Sections 9.6,9.7 of text
Friday, 30th March

This is a 15 minute quiz, worth 5% and marked out of 5 points. The total possible points awarded for each question is given in square brackets at the beginning of each question.

Name (please print): _____ . ID Number: _____
last first

The observed data of the incidence of colon cancer in parents and their children from a random sample of 329 families in a midwestern city is given in the table below.

	children have colon cancer	children do not have colon cancer	
parents have colon cancer	18	12	30
parents do not have colon cancer	22	277	299
	40	289	329

- (a) [2 points] The test of whether there is a *larger* proportion of children with colon cancer of parents who had colon cancer than of children with colon cancer of parents who did *not* have colon cancer at $\alpha = 0.05$ has an observed z test statistic value of
(circle closest one) **2.38 / 3.33 / 5.80 / 6.79 / 8.41**
- (b) [2 points] The test of whether there is a *smaller* proportion of children with colon cancer of parents who had colon cancer than of children who do *not* have colon cancer of parents who did *not* have colon cancer at $\alpha = 0.05$ has an observed z test statistic value of
(circle closest one) **-1.38 / -3.03 / -5.60 / -6.33 / -8.31**
- (e) [1 point] In general, we reject the null in a right-sided test if (circle none, one or more)
- (i) the p-value is larger than the level of significance.
 - (ii) the test statistic is smaller than the critical value.
 - (iii) the p-value is smaller than the level of significance.
 - (iv) the test statistic is larger than the critical value.
 - (v) the test statistic is larger than the level of significance.

(a) **8.41**

$$\frac{18+22}{30+299} = \frac{40}{329} = 0.212$$

$$\frac{p_1 - p_2}{\sqrt{\frac{\hat{p}(1-\hat{p})}{n_1} + \frac{\hat{p}(1-\hat{p})}{n_2}}} = \frac{\frac{18}{30} - \frac{22}{299}}{\sqrt{\frac{\frac{40}{329} \cdot \frac{289}{329}}{30} + \frac{\frac{40}{329} \cdot \frac{289}{329}}{299}}} \quad \text{) or use your calculator, 2-PropZTest}$$

(b) **-5.60**

$$\frac{18+277}{30+299} = \frac{295}{329} = 0.897$$

$$\frac{p_1 - p_2}{\sqrt{\frac{\hat{p}(1-\hat{p})}{n_1} + \frac{\hat{p}(1-\hat{p})}{n_2}}} = \frac{\frac{18}{30} - \frac{277}{299}}{\sqrt{\frac{\frac{295}{329} \cdot \frac{34}{329}}{30} + \frac{\frac{295}{329} \cdot \frac{34}{329}}{299}}} \quad \text{or use your calculator, 2-PropZTest}$$

(c) (iii), (iv)