## Question 1(6 marks)

A town well in Woburn was contaminated with industrial chemicals. During the time the residents drank the water there were 16 birth defects among 414 births. In the years after the well was shut off and water was supplied from other wells, there were 3 birth defects in 228 births. In a court case about this, the plaintiff is suing the firm responsible for the contamination and claims that there were more birth defects when the contaminated well was in use. How statistically significant is this evidence? What assumption does your analysis require? Do these assumptions seem reasonable in this case?

	Total Births	# of Birth Defects
Contaminated Water	414	16
Non-Contaminated	228	19
Water		
Totals	642	19

Ho:  $p_c = p_{nc}$ 

Ha:  $p_c > p_{nc}$ 

- $p_c = 16/414 = 0.03865$
- $p_{nc} = 3/228 = 0.01319$
- $p_{total} = 19/642 = 0.02960$

S = 0.01398

Z = 1.82; p = 0.0344

Since p < 0.05 we reject the Ho. Contaminated water is linked to increased birth defects.