Stat 2470, Quiz #3, Spring 2014 Name KEY

Instructions: Show all work. You may use your calculator rather than compute formulas by hand, but if you do, 'show work' by saying which program you used to obtain the result and what information you entered. Round measures of center to one decimal place more than the data, and variance/standard deviation to two decimal places more than the original data. Round probabilities to three decimal places (or percent plus one decimal place).

1. According to a Yale webpage, the probability of a positive blood test for HIV (using one type of test available) given that you did have the disease is 99.7%. The probability of testing negative given that you are indeed HIV-negative is 99.6%. It is estimated by the CDC that only 0.35% of the US population has HIV.
   a. What is the probability of obtaining a positive test result for HIV?

$.0035 * .997 + .9965 * .004 = .0074755$

   b. What is the probability that you have HIV given that you've had a positive test result?

$$\frac{.0035 * .997}{.0074755} = .46679$$

$\approx 47\%$

2. Is party affiliation independent of one's views on climate change? According to a paper published by Yale, they obtained the results shown in the table below. Show work to justify your answer.

Party Affiliation/Climate Change Views	Democrat/Independent (D)	Republican/Tea Party (R)	
Climate Change is Happening (C)	387	105	492
Climate Change is not Happening (C')	128	189	317
	515	294	809

$P(C|D) = \frac{387}{515} = .7515$ $\quad P(C|R) = 35.71\% = \frac{105}{294}$

75.15%

$P(C) = \frac{492}{809} = 60.82\%$

Since $P(C|D) \neq P(C|R) \neq P(C)$

these opinions are not independent