Stat 2470, Quiz #15, 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. Use the data in the table to construct a scatter plot. Then use the data to calculate a linear regression model for the data. Does the line you calculated appear to fit the data well?

X	47	62	65	70	78	99	100	106	114
y	127	114	134	139	142	170	149	154	215
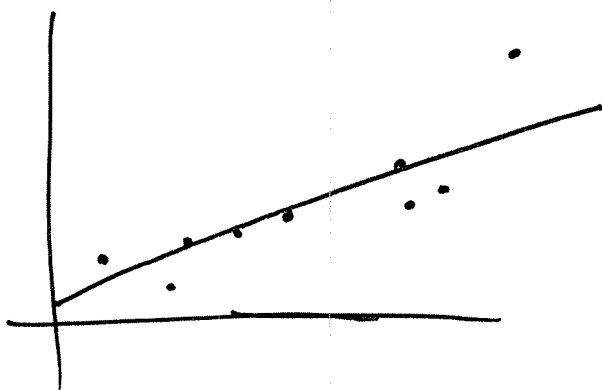
$$\hat{y} = 1.04x + 63.64$$

$$r^2 = .67...$$

$$r = .82...$$

not too bad, but the last value may be throwing off the line a little bit

2. Use what you obtained above to predict the value for x=75. What is the error estimate on your y-value?

$$\hat{y} = 1.04(75) + 63.64 = 141.64$$

assuming 95% confidence on the prediction

$$n = 9$$

$$t_{\alpha/2, n-2} = TInv(.975, 7) = 2.36$$

$$141.64 \pm 2.36\sqrt{s^2 + s_{\hat{y}}^2} \qquad S = 17.97 \text{ (from LinRegTTest)}$$

$$S_{xx} = 65295 - \frac{(741)^2}{9} \qquad s_{\hat{y}}^2 = s^2\left(\frac{1}{n} + \frac{(x^* - \bar{x})^2}{S_{xx}}\right) = 39.93$$

$$1VarStats = 4286 \qquad \Rightarrow 141.64 \pm 44.95 = (96.69, 186.59)$$