Section #11

1. The elongation of a steel cable is assumed to be linearly related to the amount of force applied. Five identical specimens of cable gave the following results when varying forces were applied.

Force (x)	1.0	1.5	2.0	2.5	3.0
Elongation (y)	3.0	3.8	5.4	6.9	8.4

(a) Use the method of least squares to fit the regression line.

(b) Determine the coefficient of correlation for this linear relationship.

(c) Estimate the expected elongation for a force of 1.8 using a 90% Prediction Interval.

2. Use least-squares regression to fit a linear polynomial to the data given in the table below:

x	10	20	30	40	50	60	70	80	90
y	418.41	418.61	418.69	418.99	419.19	419.32	419.52	419.79	419.99

(a) Calculate the standard deviation for the regression line.

(b) Use the fitted linear formula to estimate the y-value at x = 73.7.

(c) Find the 95% Confidence Interval for the mean when x equals 68.