KNR 445: Some regression practice

1) Say you have a regression equation of $Y' = 85 + 6X$. $Y'$ is estimated IQ, $X$ is years in education. $R^2$ is .25, and the standard error of the estimate is 10 IQ points.
   a) What is the slope, and what is the intercept?
   b) What would be the predicted IQ for someone with 10 years of education?
   c) Say you found a person with an IQ of 120 who had received 10 years of education. What would be the residual for this person?
   d) How much higher of an IQ does the model predict for someone who has 8 years of education than someone who has 5?
   e) What range of IQ’s might we expect to see 95% of the time for 5 years in education?
   f) How about a range of IQ’s expected 68% of the time for 10 years of education?
   g) Draw the regression line in the following chart:

2) If the sample upon whom the previous equation is based had only a small range of years of education, what effect would this have on the equation’s ability to predict effects of larger periods of education, and why?

3) What is the relationship between the coefficient of determination and the standard error?

4) What is the conceptual similarity between the SD for a normal distribution, and the SE for regression?