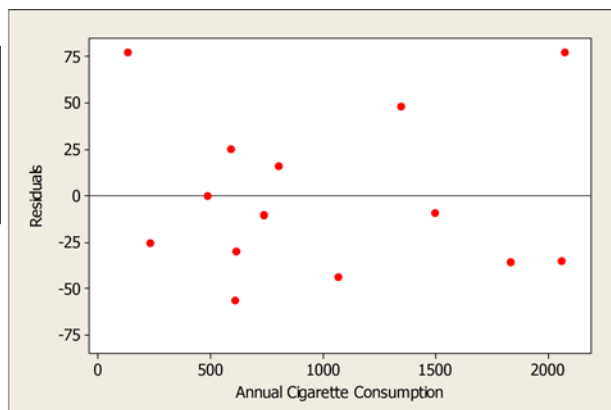


Is there a link between the amount of cigarette smoking in countries and death rates from coronary heart disease (CHD)? Below is computer output from a regression analysis of this relationship for 14 randomly-selected countries from around the world, along with a residual plot. The explanatory variable is annual consumption of cigarettes per person and the response variable is annual deaths from coronary heart disease per 100,000 people.

Predictor	Coef	SE Coef	T	P
Constant	65.44	22.82	2.87	0.014
Cigarettes	0.02268	0.01926	1.18	0.262

$S = 45.2672$     $R\text{-Sq} = 10.4\%$     $R\text{-Sq}(\text{adj}) = 2.9\%$



1. What is the equation of the least-squares regression line based on these data? Define any variables used.
2. Interpret the slope of the regression line.
3. If we are trying to determine the relationship between these two variables throughout the world, is the slope you provided in part (a) a statistic or a parameter? Explain.

4. Based on the information given, discuss whether the conditions have been met to use  $t$ -procedures to make inferences about the slope of the regression line. If you do not have enough information to determine if a condition is met, indicate what other information or analysis is required.

5. Assuming all conditions have been met, construct and interpret a 90% confidence interval for the slope of the least squares regression of annual CHD deaths on annual cigarette consumption.

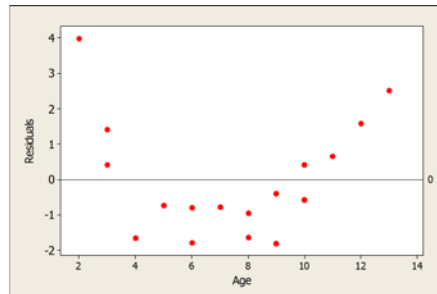
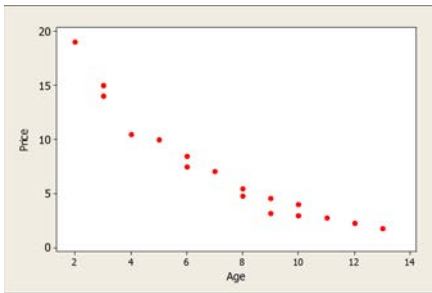
6. If you were to perform a test of the hypotheses  $H_0 : \beta = 0$  versus  $H_a : \beta \neq 0$  at the  $\alpha = 0.10$  level, what would you conclude? Justify your answer using your result in Question 5.

Lupe is shopping for a used car and collects data on age (in years) and price (in 1000s of dollars) for Ford Taurus sedans on a used-car web site. On this page is computer output for three different regression models: Price vs. Age, Log (Price) vs. Age, and Log (Price) vs. Log (Age). Questions about these data are on the next page. All logarithms are base 10.

### I. Price versus Age

Predictor	Coef	SE Coef	T	P
Constant	17.870	1.030	17.35	0.000
Age	-1.4300	0.1276	-11.21	0.000

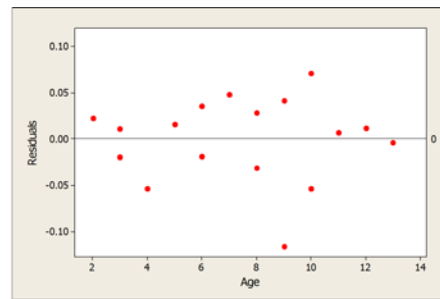
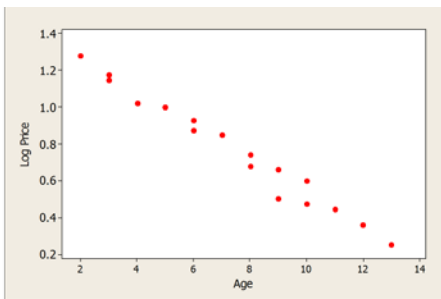
S = 1.68336    R-Sq = 89.3%    R-Sq(adj) = 88.6%



### II. Log Price versus Age

Predictor	Coef	SE Coef	T	P
Constant	1.43723	0.02881	49.89	0.000
Age	-0.090652	0.003569	-25.40	0.000

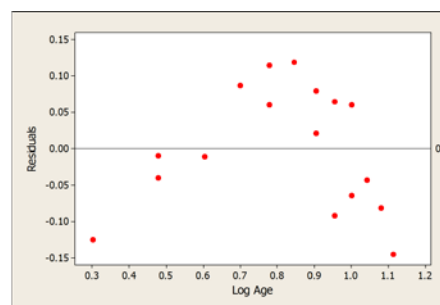
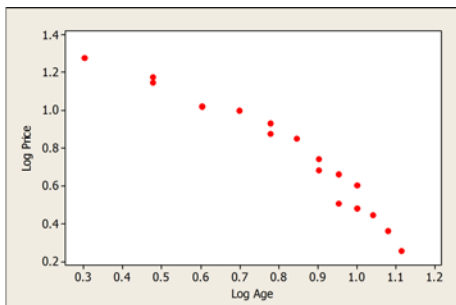
S = 0.0470892    R-Sq = 97.7%    R-Sq(adj) = 97.6%



### III. Log Price versus Log age

Predictor	Coef	SE Coef	T	P
Constant	1.77448	0.07822	22.69	0.000
Log Age	-1.23359	0.09209	-13.40	0.000

S = 0.0867773    R-Sq = 92.3%    R-Sq(adj) = 91.8%



- 7 Explain how the information provided suggests that a linear model may not be appropriate for describing the relationship between car age and price.
8. Would an exponential model or a power model provide a better description of this relationship? Use the information provided to justify your answer.
9. Give the equation of the model you chose in Question 2, using the transformed variable(s).
10. Use the model you chose in Question 2 to predict the price of a 5-year-old Ford Taurus. Show your work!