AP STATISTICS

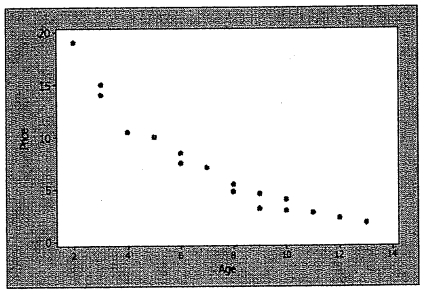
(Exponential Models)

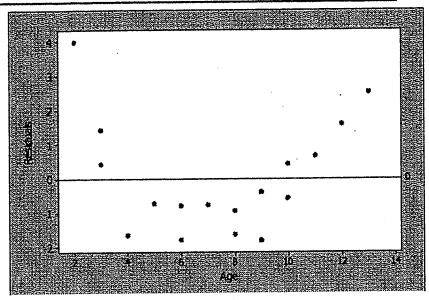
Brandon is shopping for a used car and collects data on age (in years) and price (in 1000s of dollars) for Ford Taurus sedans on a used-car Web site. Below are computer outputs for two different regression models: Price *vs* Age and Log (Price) *vs* Age. All logarithms are base 10.

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%

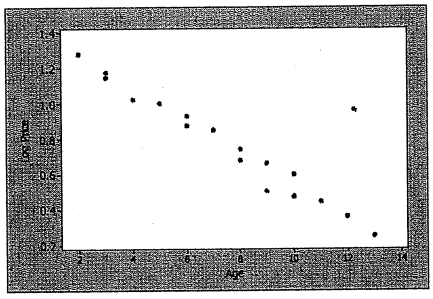


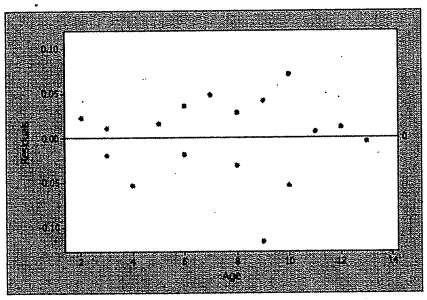


II. Log Price *versus* Age

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%





1. Explain how the information provided suggests that an exponential model would describe the relationship between car age and price better than a linear model would.

2. Write the equation of the exponential model in the form of $\hat{y} = ab^x$

3. Use the exponential model to predict the price of a 5-year old Ford Taurus.

According to data from the U.S. Health Care Financing Administration, the national expenditures for drugs (in billions of dollars) for selected years from 1970 to 1997 are as follows:

Year	70	80	85	87	89	90	91	92	93	94	95	97
Spent	8.8	21.6	37.1	43.2	50.6	59.9	65.6	71.2	75	77.7	83.4	108.9

4. Justify why an exponential model would describe the relationship between year and expenditures better than a linear model.

5. Write the equation of the exponential model in the form of $\hat{y} = ab^x$

6. Predict the national drug expenditures for this year. Do you have confidence in this result? Why or why not?