1. The interpretation of the slope coefficient in the model $Y = b_0 + b_1 \ln(X)$ is as follows:
   
   - A) a 1% change in $X$ is associated with a $b_1\%$ change in $Y$.
   - B) a 1% change in $X$ is associated with a change in $Y$ of $0.01 \times b_1$.
   - C) a change in $X$ by one unit is associated with a $100 \times b_1\%$ change in $Y$.
   - D) a change in $X$ by one unit is associated with a $b_1$ change in $Y$.

   **Correct answer(s): B**

2. The interpretation of the slope coefficient in the model $\ln(Y) = b_0 + b_1 X + u$ is as follows:
   
   - A) a 1% change in $X$ is associated with a $b_1\%$ change in $Y$.
   - B) a change in $X$ by one unit is associated with a $100 \times b_1\%$ change in $Y$.
   - C) a 1% change in $X$ is associated with a change in $Y$ of $0.01 \times b_1$.
   - D) a change in $X$ by one unit is associated with a $b_1$ change in $Y$.

   **Correct answer(s): B**

3. The interpretation of the slope coefficient in the model $\ln(Y) = b_0 + b_1 \ln(X) + u$ is as follows:
   
   - A) a 1% change in $X$ is associated with a $b_1\%$ change in $Y$.
   - B) a change in $X$ by one unit is associated with a $b_1$ change in $Y$.
   - C) a change in $X$ by one unit is associated with a $100 \times b_1\%$ change in $Y$.
   - D) a 1% change in $X$ is associated with a change in $Y$ of $0.01 \times b_1$.

   **Correct answer(s): A**

4. In the case of regression with interactions, the coefficient of a binary variable should be interpreted as follows:
   
   - A) there are really problems in interpreting these, since the $\ln(0)$ is not defined.
   - B) for the case of interacted regressors, the binary variable coefficient represents the various intercepts for the case when the binary variable equals one.
   - C) first set all explanatory variables to one, with the exception of the binary variables. Then allow for each of the binary variables to take on the value of one sequentially. The resulting predicted value indicates the effect of the binary variable.
   - D) first compute the expected values of $Y$ for each possible case described by the set of binary variables. Next compare these expected values. Each coefficient can then be expressed either as an expected value or as the difference between two or more expected values.

   **Correct answer(s): D**

5. A nonlinear function
   
   - A) makes little sense, because variables in the real world are related linearly.
   - B) can be adequately described by a straight line between the dependent variable and one of the explanatory variables.
   - C) is a concept that only applies to the case of a single or two explanatory variables since you
cannot draw a line in four dimensions.

☐ D) is a function with a slope that is not constant.

**Correct answer(s):** D

6. (Requires Calculus) In the equation TestScore = 607.3 + 3.85*Income - 0.0423*Income^2, the following income level results in the maximum test score

☐ A) 607.3

☐ B) 91.02

☐ C) 45.50

☐ D) cannot be determined without a plot of the data.

**Correct answer(s):** C

7. To decide whether Y = b0 + b1*X + u or ln(Y) = b0 + b1*X + u fits the data better, you cannot consult the regression R-square because

☐ A) ln(Y) may be negative for 0

☐ B) the TSS are not measured in the same units between the two models.

☐ C) the slope no longer indicates the effect of a unit change of X on Y in the log-linear model.

☐ D) the regression can be greater than one in the second model.

**Correct answer(s):** B

8. You have estimated the following equation: TestScore = 607.3 + 3.85*Income - 0.0423*Income^2, where TestScore is the average of the reading and math scores on the Stanford 9 standardized test administered to 5th grade students in 420 California school districts in 1998 and 1999. Income is the average annual per capita income in the school district, measured in thousands of 1998 dollars. The equation

☐ A) suggests a positive relationship between test scores and income for most of the sample.

☐ B) is positive until a value of Income of 610.81.

☐ C) does not make much sense since the square of income is entered.

☐ D) suggests a positive relationship between test scores and income for all of the sample.

**Correct answer(s):** A

9. For the polynomial regression model,

☐ A) you need new estimation techniques since the OLS assumptions do not apply any longer.

☐ B) the techniques for estimation and inference developed for multiple regression can be applied.

☐ C) you can still use OLS estimation techniques, but the t-statistics do not have an asymptotic normal distribution.

☐ D) the critical values from the normal distribution have to be changed to 1.962, 1.963, etc.

**Correct answer(s):** B

10. To test whether or not the population regression function is linear rather than a polynomial of order
A) check whether the regression for the polynomial regression is higher than that of the linear regression.
B) compare the TSS from both regressions.
C) look at the pattern of the coefficients: if they change from positive to negative to positive, etc., then the polynomial regression should be used.
D) use the test of (r-1) restrictions using the F-statistic.

Correct answer(s): D