

Multiple Choice

- 1) c 2) d 3) b 4) a 5) b 6) c 7) d 8) c

9) A) Explanatory variable - # of years a student was enrolled in a foreign language course  
Response variable - score on the English achievement test.

B) The student may be more gifted in languages. The student's existing language skills may make them more likely to study a foreign language.

10) A) Yes, a line is appropriate because the residual plot is evenly scattered with low values and no obvious pattern.

B) slope = 233.517  
As the year increases by 1, the number of commercial aircraft flying in the US increases by 233.517 planes.

C) intercept = 2939.93  
In 1990, there were 2939.93 commercial aircraft flying in the US.

D)  $\hat{\text{Aircraft}} = 2939.93 + 233.517(\text{year})$   
 $= 2939.93 + 233.517(2)$

$\hat{\text{Aircraft}} = 3406.964 \text{ planes}$

E) Residual =  $y - \hat{y}$

$40 = y - 3406.964$

$y = 3446.964$

⑪ Point  $(\bar{x}, \bar{y})$  and slope  $b = r \left( \frac{s_y}{s_x} \right)$

$$b = .877 \left( \frac{12.799}{1.084} \right)$$

$$b = 10.35 \quad \text{through } (3.58, 71.01)$$

$$y = a + bx$$

$$71.01 = a + 10.35(3.58)$$

$$a = 33.96$$

$$\hat{\text{time between eruptions}} = 33.96 + 10.35(\text{Duration time})$$

$$= 33.96 + 10.35(4.5)$$

$$= 80.54 \text{ minutes}$$

If an eruption lasts 4.5 minutes, the predicted time until the next eruption is 80.54 minutes.

⑫

A)  $\hat{\text{operating costs}} = 1136 + 14.673(\text{seats})$

B)  $r = \sqrt{.57} = 0.755$ . This indicates that the linear relationship between the number of seats on a plane and operating costs is strong and positive.

C) No, in the range of 250 to 350 seats on the scatterplot, the data actually shows a negative association. A new equation would be needed for this range of data.

D) 57% of the variation in operating costs can be explained by the LSRL of operating costs on number of seats.