6 **a** $H_0 : \rho_{YX_3 | X_1} = 0 \qquad H_A : \rho_{YX_3 | X_1} \neq 0$

$$F(X_3 | X_1) = \frac{7010.03}{\frac{2259.16}{22}} = 68.265 \qquad (1, 22 \text{ df})$$

$P < 0.001$

At $\alpha = 0.05$ we reject H_0 and conclude that X_3 added to a model already containing X_1 does explain a significant amount of variation in Y.

b $H_0 : \rho_{YX_2 | X_1, X_3} = 0 \qquad H_A : \rho_{YX_2 | X_1, X_3} \neq 0$

$$F(X_2 | X_1, X_3) = \frac{10.93}{\frac{2248.23}{21}} = 0.102 \qquad (1, 21 \text{ df})$$

$P > 0.25$

At $\alpha = 0.05$ we do not reject H_0 and conclude that X_2 added to a model already containing X_1 and X_3 does not explain a significant amount of variation in Y.

c $H_0 : \rho_{Y(X_2, X_3) | X_1} = 0 \qquad H_A : \rho_{Y(X_2, X_3) | X_1} \neq 0$

$$F(X_2, X_3 | X_1) = \frac{(7010.03 + 10.93)/2}{2248.23/21} = 32.79 \qquad (2, 21 \text{ df})$$

$P < 0.001$

At $\alpha = 0.05$ we reject H_0 and conclude that X_2 and X_3 added to a model already containing X_1 explain a significant amount of variation in Y.

d We would include X_1 and X_3 in the model and omit X_2.