

1. The following regression output is for predicting annual murders per million from the percentage of citizens living in poverty in a random sample of 20 metropolitan areas.

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-29.901	7.789	-3.839	0.001
poverty%	2.559	0.390	6.562	0.000

$$s = 5.512$$

$$R^2 = 70.52\%$$

$$R_{adj}^2 = 68.89\%$$

- (a) Write out the linear model.
- (b) Interpret the slope.
- (c) Interpret R^2 .
- (d) Calculate the correlation coefficient.
- (e) Interpret the correlation coefficient.
- (f) Predict the number of murders per million if one city has a 14% of its citizens living in poverty.
- (g) After a few months, the city with 14% of its citizens living in poverty reported the number of murders per million was 4.773. Calculate the residual for this city's reported murder rate.

2. A regression line relating y = hours of sleep the previous day to x = hours studied the previous day is estimated using data from $n = 10$ students. The estimated slope $\beta_1 = -0.30$. The standard error of the slope is 0.20.

(a) What is the value of the test statistic for the following hypothesis test about , the population slope?

$$H_o: \beta_1 = 0$$

$$H_a: \beta_1 \neq 0$$

(b) At the $\alpha = 0.10$ level, would you reject the null hypothesis? State your conclusion in terms of the problem.

(c) What is a 90% confidence interval for β_1 , the population slope? Interpret the confidence interval you calculate.