Question 14

(a) What is the term for constant variance?
(b) What is the sum of squares for error(SSE)?
(c) What is the range of values of SSR/SST?
(d) What is the terminology for SSR/SST?
(e) What is the range of values of correlation?
(f) What are the assumptions of Linear regression?

Question 15
The following regression output is for predicting annual murders per million from percentage unemployed in a random sample of 20 metropolitan areas. Use the following Stata Output to answer the following questions.

Source	SS	df	MS	Number of obs	=	20
				F(1, 18)	=	53.41
Model	1387.59972	1	1387.59972	Prob > F	=	0.0000
Residual	467.602282	18	25.9779045	R-squared	=	0.7480
				Adj R-squared	=	0.7339
Total	1855.202	19	97.6422105	Root MSE	=	5.0969

annual_mur~l	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
perc_unemp	7.079554	.9686701	7.31	0.000	5.044454	9.114655
_cons	-28.52671	6.813718	-4.19	0.001	-42.8418	-14.21162

Alternate text for Stata output picture: The R-square is 0.7480. The coefficient for percent unemployed is 7.079 and the constant is -28.53.

(a) Obtain the best least squares fit for the data.

(b) Interpret the intercept and slope.

(c) What is the proportion of variance explained by the model?

Question 16

Information on travel time (t) and distance (d) from one stop to the next is collected for Amtrak train that runs from Seattle to Los Angeles. Claire used simple linear regression to predict travel time (t) and estimated the following statistics. Use the provided statistics to answer the following:

n	10
$\bar{t}$	107.43
$\bar{d}$	128.88
$\sum(d_i - \bar{d})^2$	147911.938
$\sum(t_i - \bar{t})^2$	148287.811
$\sum(d_i - \bar{d})(t_i - \bar{t})$	296446.059
$\sum(y_i - \hat{y})^2$	592892.117
$\sum(y_i - \bar{y})^2$	1185784.23
SST = SSR + SSE	

Alternate text for Table:

(a) Calculate the slope and intercept

(b) Interpret the slope and intercept

(c) Calculate the coefficient of determination and interpret it.

(d) What is the sum of SSE and what is its interpretation?

(e) The distance between Santa Barbara and Los Angeles is 103 miles. Use the model to estimate the time it takes for starlight to travel between these two cities.