AP Stats
Chap 8 Classwork Name Key Pd _____

Flight Distances and Fares.
How related are the distances and accompanying fares for flights from the Atlanta International Airport to several other cities? Use the data at the right – and the given summary statistics – to answer the following questions.

Atlanta to:	Distance	Fare
Baltimore	568	219
Boston	933	222
Dallas	720	249
Denver	1190	308
Detroit	602	249
Kansas City	683	141
Las Vegas	1719	252
Miami	589	229
Memphis	327	183
Minneapolis	894	209
New Orleans	419	199
NY	749	248
Okla City	749	301
Orlando	392	238
Philadelphia	657	205
St Louis	461	232
Salt Lake	1565	371
Seattle	2150	343
Summary Statistics		
Mean	853.7	244.33
St Dev	497.8	56.37
Correlation	0.694	

1. Find r^2. 1. .482

2. Explain what r^2 means in this context. 48.2% of the variability in airfare is accounted for in the model, by the differences (variation) in traveled distances

3. Find the slope of the regression line. 3. .078578

4. Find the y-intercept of the regression line. 4. 177.24

5. Write the equation of the linear model. $\hat{fare} = 177.24 + .079(distance)$

6. Estimate the fare for a 200-mile flight. 6. #192.96

7. Estimate the fare for a 2000-mile flight. 7. #334.40

8. Using your estimates, draw the Line of Best Fit on the scatterplot.

9. Explain what the y-intercept means in this context. The base fare (if you flew zero miles) would be about #177.24.

10. Explain what the slope means in this context. Each additional one mile in flight distance costs approximately #.079 more

11. The fare to fly to Los Angeles, 1719 miles from Atlanta, is $212. Find the residual. 11. #-100.32

(the model predicts #312.32 for 1719 miles)

#212 − 312.32 =

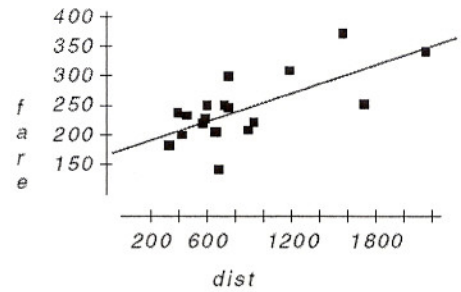
Use the following original scatterplot, residual plot, and computer analysis to answer the following. (Hint: Refer to page 188 of your text book for help!)

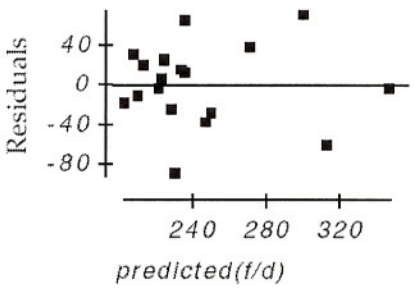
Dependent variable is: fare
No Selector
R squared = 48.2% *R squared (adjusted) = 45.0%*
s = 41.82 with 18 - 2 = 16 degrees of freedom

Source	Sum of Squares	df	Mean Square	F-ratio
Regression	26037.4	1	26037.4	14.9
Residual	27980.6	16	1748.79	

Variable	Coefficient	s.e. of Coeff	t-ratio	prob
Constant	177.215	19.99	8.86	≤ 0.0001
dist	0.078619	0.0204	3.86	0.0014

y-int slope





12. Is the linear model appropriate for estimating airfare from the distance flown? Why?

The scatterplot of original data is straight enough, and the residual plot shows no pattern, so a linear model is appropriate

13. How strong is this model? Explain.

only 48.2% of the variation in fare is accounted for by the variation in traveled distances. The other 51.8% is from other forces. (not very strong)

14. Identify any possible outliers. Why are they unusual?

$150 for a flight of about 700 miles seems relatively low, compared to the others

15. Write the equation of this model. 15. $\hat{fare} = 177.215 + .078619(distance)$

16. Predict the airfare for a 1000-model flight. 16. $255.83