Chapter 7

6. (5 points) Scatterplots.
a) #1 shows little or no association.
b) #4 shows a negative association.
c) #2 and #4 each show a straight association.
d) #3 shows a moderately strong, curved association.
e) #2 and #4 each show a very strong association, although some might classify the association as merely "strong".

18. (4 points) Drug abuse.
a) A scatterplot of percentage of teens who have used other drugs vs. percentage who have used marijuana in the U.S. and 10 Western European countries is shown at the right.

b) The correlation between the percent of teens who have used marijuana and the percent of teens who have used other drugs is $r = 0.934$.

c) The association between the percent of teens who have used marijuana and the percent of teens who have used other drugs is positive, strong, and straight. Countries with higher percentages of teens who have used marijuana tend to have higher percentages of teens that have used other drugs.

d) These results do not confirm that marijuana is a "gateway drug". An association exists between the percent of teens that have used marijuana and the percent of teens that have used other drugs. This does not mean that one caused the other.

20. (2 points) Burgers II.
a) A scatterplot of fat content vs. calorie content of several fast food burgers is shown at the right.
b) The correlation between the number of calories and the number of grams of fat in several fast food burgers is $r \cdot$ 0.961. There is a strong, positive linear correlation between fat and calories in several brands of fast food burgers. One burger had a much lower fat content than the other burgers, at 19 grams of fat with 410 calories. Without this (comparatively) low fat burger, the correlation would still be fairly strong and positive

Chapter 8

38. (4 points) Cost of living 2008.
a) The association between cost of living in 2007 and 2008 is linear, positive and strong. The scatterplot is Straight Enough, indicating that the linear model is appropriate.

b) $R^2 = (0.938)^2 = 0.880$. This means that 88.0% of the variability in cost of living in 2008 can be accounted for by variability in cost of living in 2007.

c) Oslo had a cost of living of 105.8% of New York's in 2007. According to the model, Oslo is predicted to have a cost of living in 2008 that is about 110.6% of New York's. Oslo actually had a cost of living in 2008 that was 118.3% of New York's. Oslo's residual was about +7.7%.

$Cost08 = 21.75 + 0.84 \, (Cost07 \,)$

$Cost08 = 21.75 + 0.84 \, (105.8 \,)$

$Cost08 = 110.622$

d) Oslo's cost of living in 2008 was about 5.68% less than the cost of living predicted by this model.

44. (2 points) Body fat, again. The scatterplot of % body fat and waist size is at the right. The association is strong, linear, and positive. As waist size increases, % body fat has a tendency to increase,
as well. The scatterplot is straight enough to justify the use of the linear model. The linear model for predicting % body fat from
waist size is :
 % $Fat = -62.557 + 2.222(Waist)$.

For each additional inch in waist size, the model predicts an increase of 2.222% body fat. 78.7% of the variability in % body fat can be accounted for by waist size. The residuals plot, at right, shows no apparent pattern. The residuals plot and the relatively high value of R^2 indicate an appropriate model with more predicting power than the model based on weight.