Linear Regression Review #1

1a) negative, linear, moderate, no outliers

b.) $\hat{y} = 3.5 - .0034x$

For each increase of 1 calorie of NEA, weight (fat) gain decreases by .0034 kg

c.) $r = -.78$, there is a moderate/strong negative linear association between NEA and fat gain

d.) $3.2 - [3.5 - .0034(143)] = .1862$

The actual point is above the LSR line

e.) .79 Kg

f.) This is extrapolation, the prediction is not reliable.

g.) The residual plot shows even scattering. This shows that the LSR line is a good fit for the data

h.) No outliers

2.)a.) Positive, linear, weak, one outlier

b.) $\hat{y} = 9.677 + .495x$
For each extra year since receiving their PHD, the number of publications will increase by .495

c.) $r = .29$, there is a weak, positive, linear association between years since receiving their PHD and the number of publications.

d.) Yes, (25,2). It is influential because when it is removed the LSR line changes significantly and r increases

#2 after removing (25,2)
a.) positive, linear, strong, no outliers

b.) $\hat{y} = 1.87x + 1.93$
For each additional year since receiving their PHD, the number of publications increases by 1.87

c.) $r = .77$. This shows a strong (moderate), positive linear association between years since receiving their PHD and the number of publications.

e.) $11 - [1.87(6) + 1.93] = -2.15$
the actual point is below the LSR line

f.) 29.98, confident since r is strongish and this
is no extrapolation

g) The residual plot has even scattering. This means
the LSR line is a good fit.

3a.) IV     b.) II     c.) V

d.) $\hat{y} = -3.627(23) + 7386.87 = 7303.45$

e.) No, this would not be reliable since it is
extrapolation

4a) $\hat{y} = -13.79 + 1.49x$

b.) 209.71 billion

5.) For each increase of 1 minute of use, the cell
phone plan will cost .1 more.

If you don't use your cell phone, it will cost
$15 per month.