Hw 3.2 Part A prob 27-32 (MC) pg 162-163 prob 35, 37, 39, 41 pg 191

(27) A (oil price predict price of gas)
(28) E (expect as barrel prices go up, average retail price of gallon of gas goes up)
(29) D (all Japense cars fall in lower/left half of graph
(30) B (exactly linear since men's age is always 2 years older than women's age)
(31) C
(32) D (positive, but not strong enough to be 0.95)

(35) y intercept = 80 grams slope = -6 grams/day
$\hat{y} = 80 - 6x$ is the equation for the regression line

(37) a) The slope is 1.109 we predict that highway mileage will increase by 1.109 mpg for each 1 mpg increase in city mileage.
($\widehat{\text{highway mpg}} = 4.62 + 1.109(\text{city mpg})$, slope = highway mpg/city mpg)

b) The intercept is 4.62 mpg. This is not statistically meaningful b/c this would represent the highway mileage for a car that gets 0 mpg in the city.

c) $\widehat{\text{highway mpg}} = 4.62 + 1.109(16) = 22.36$ mpg
$\widehat{\text{highway mpg}} = 4.62 + 1.109(28) = 35.67$ mpg

(39) $\widehat{pH} = 5.43 - 0.0053(\text{weeks})$ slope = $\Delta pH / \Delta \text{weeks}$
a) The slope is -0.0053; the pH decreased 0.0053 units per week on average.

b) The y-intercept is 5.43 and it tells us the level of pH at the beginning of the study.

c) $\widehat{Ph} = 5.43 - 0.0053(150) = \boxed{4.635}$

ii) No. The data was collected for 150 weeks. 1000 month is approximately 4000 weeks, which is well outside the observed time period. This would be extrapolation.