1. Fitted $y$ given $x = x^*$
   \[
   \hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x^*
   \]

2. Confidence intervals for $\beta_0 + \beta_1 x^*$
   \[
   \hat{\beta}_0 + \hat{\beta}_1 x^* \pm t_{\alpha/2,n-2} \cdot s \sqrt{\frac{1}{n} + \frac{(x^* - \bar{x})^2}{S_{xx}}}
   \]

3. Prediction intervals for $y$ given $x = x^*$
   \[
   \hat{\beta}_0 + \hat{\beta}_1 x^* \pm t_{\alpha/2,n-2} \cdot s \sqrt{1 + \frac{1}{n} + \frac{(x^* - \bar{x})^2}{S_{xx}}}
   \]

Homework - due Monday, May 5, 2008

1. Read Section 8.3.
2. Do problems 8.2de, 8.3cd.

Useful R

```r
> fo=read.csv('http://www.calvin.edu/~stob/data/fruitohms.csv')
> l=lm(ohms~juice,data=fo)
> l
Call:
  lm(formula = ohms ~ juice, data = fo)
Coefficients:
(Intercept)   juice
       7519.40      -89.88
> xstar=data.frame(juice=c(10,20,30,40,50))
> predict(l,xstar)
     1     2     3     4     5
6620.630 5721.855 4823.080 3924.305 3025.530
> predict(l,xstar,interval='confidence')
     fit   lwr   upr
     1 6620.630 6262.315 6978.944
     2 5721.855 5455.122 5988.587
     3 4823.080 4617.389 5028.771
     4 3924.305 3719.669 4128.941
     5 3025.530 2761.242 3289.818
> predict(l,xstar,interval='prediction')
     fit   lwr   upr
     1 6620.630 4370.8945 8870.364
     2 5721.855 3484.8779 7958.831
     3 4823.080 2592.5580 7033.601
     4 3924.305 1693.8801 6154.730
     5 3025.530  788.8434 5262.216
```