Chapter 1

SSE	$\sum(e_i{}^2)$
MSE	$\frac{SSE}{n-2} = s^2$
b_1	$r(s_y/s_x)$
b_1^*	$b_1(s_x/s_y)$

b_1^* means an increase of 1 sd in X is associated with an increase of b_1^* sd of Y.
For OLS, minimize Q (SSE)

Chapter 2

Test Statistic $t^* = \frac{b_1}{s(b_1)}$
Critical Value (t) $= t(1-\alpha/2; n-2)$
Confidence Limits $b_1 \pm t(s\{b_1\})$

Hypothesis Testing:
1) Set up H_0 and H_1
2) Choose significance level α
3) Calculate test statistic t^*
4) Determine critical value or p-value
5) Make a decision:
p-value approach:
$p \leq \alpha$ Reject H_0
$p > \alpha$ Fail to reject H_0
critical value approach:
if $|t^*| > t$ Reject H_0
if $|t^*| \leq t$ Fail to reject H_0
Since $|t^*| > t$ or $p \geq \alpha$, Reject H_0 and conclude H_1 at the α level

$SSTO = SSR + SSE$
$SSTO = \sum (Y_i - \bar{Y})^2$; $df = n-1$
$SSR = \sum (\hat{Y}_i - \bar{Y})^2$; $df = 1$
$SSE = \sum (Y_i - \hat{Y}_i)^2$; $df = n-2$
Test Statistic $F^* = MSR/MSE$; where $MSR = SSR$
Critical Value $F(1-\alpha; 1, n-2)$
$F^* = (t^*)^2$