Review 6.1, 6.2, 6.8, 6.9, 6.10, 6.14
Exercise 6.3 6.4

6.3.)

a.) $f'(x) = 2x$

$f''(x) = 2$

$f'(0) = 0$

$f''(0) = 2 > 0$

0 is minimum

b.) $f'(x) = 3x^2$

$f''(x) = 6x$

$f'(0) = 0$ and $f''(0) = 0$

0 is a critical point, 2nd order optimality condition is inconclusive. 0 -> inflection point

c.) $f'(x) = 4x^3$

$f''(x) = 12x^2$

$f'(0) = 0$

$f''(0) = 0$

0 is a critical point, same as previous question except 0 -> minimum

d.) $f'(x) = -4x^3$

$f''(x) = -12x^2$

$f'(0) = 0$

$f''(0) = 0$

0 is a critical point and maximum.
2nd order is inconclusive.

6.1.)
6.2.) True
6.8.) a) x_1 and x_2 b.) Since unimodal, you know min will not be in x_2
6.9.)
6.10.)
6.14.)