P.202 #23

$y = x\sqrt{4-x}$

Domain:

$4 - x \geq 0$

$x \leq 4$

$(-\infty, 4]$

$$f'(x) = x \cdot \frac{1}{2}(4-x)^{-\frac{1}{2}}(-1) + \sqrt{4-x}\,(1)$$

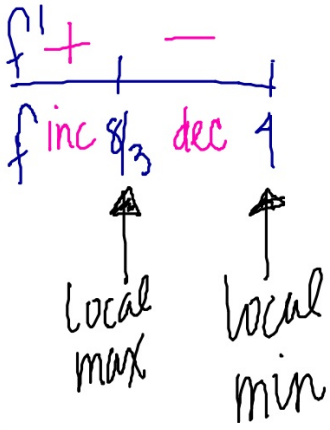
$$= \frac{-x}{2\sqrt{4-x}} + \frac{2\sqrt{4-x}^{2}}{2\sqrt{4-x}}$$

$$= \frac{-x + 8 - 2x}{2\sqrt{4-x}} = \frac{-x + 2(4-x)}{2\sqrt{4-x}}$$

$$f'(x) = \frac{8-3x}{2\sqrt{4-x}}$$

$8 - 3x = 0$ $\quad x = 8/3$

$2\sqrt{4-x} = 0$ $\quad x = 4$



Inc $(-\infty, 8/3)$

Dec $[8/3, 4]$

p.215 #1

$y = x^2 - x - 1$

$y' = 2x - 1$

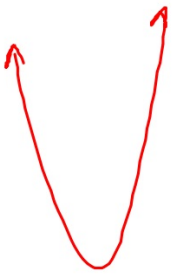
CE #s

$2x - 1 = 0$

$x = 1/2$

f'	$-$	0	$+$
f	dec	$1/2$	inc

f(x) has a local min @ $x = 1/2$ of $-5/4$.



p. 215 #17 $y = x^{\frac{1}{3}}(x-4)$

$y' = x^{\frac{1}{3}}(1) + (x-4)\left(\frac{1}{3}x^{-2/3}\right)$

$x^{\frac{1}{3}} + \frac{1}{3}x^{\frac{1}{3}} - \frac{4}{3}x^{-2/3}$

$y' = \frac{4}{3}x^{\frac{1}{3}} - \frac{4}{3}x^{-2/3}$

$y'' = \frac{4}{9}x^{-2/3} - \frac{8}{9}x^{-5/3}$

$= \frac{4x}{9x^{2/3}\cdot x} - \frac{8}{9x^{5/3}}$

$y'' = \frac{4x-8}{9x^{5/3}}$

$4x - 8 = 0$

$x = 2$

$9x^{5/3} = 0$

$x = 0$

f'' + | − | +

f conc↑ 0 conc↓ 2 conc↑