4.1 #37

domain $[0, \infty)$

$-\frac{1}{4} - -\frac{3}{4} = -\frac{1}{4} + \frac{3}{4} = \frac{2}{4} = \frac{1}{2}$

$h(t) = t^{3/4} - 2t^{1/4}$

$h'(t) = \frac{3}{4}t^{-1/4} - 2\left(\frac{1}{4}\right)t^{-3/4}$

$h'(t) = \frac{3}{4}t^{-1/4} - \frac{1}{2}t^{-3/4} = \frac{1}{2}t^{-3/4}\left(\frac{3}{2}t^{1/2} - 1\right) = \frac{\frac{3}{2}t^{1/2} - 1}{2t^{3/4}}$

$\frac{0}{1} = \frac{\frac{3}{2}t^{1/2} - 1}{2t^{3/4}}$

$h'(t) = DNE$

$t = 0$

domain $[0, \infty) \cap t \neq 0$

domain $(0, \infty)$

$0 = \frac{3}{2}t^{1/2} - 1$

$1 = \frac{3}{2}t^{1/2}$

$\left(\frac{2}{3}\right)^2 = \left(t^{1/2}\right)^2$

$\frac{4}{9} = t$

4.3 #36

domain $(-\infty, \infty)$

$B(x) = 3x^{2/3} - x$

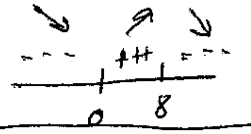
$B'(x) = 3\left(\frac{2}{3}\right)x^{-1/3} - 1 = \frac{2}{x^{1/3}} - \frac{1x^{1/3}}{1x^{1/3}} = \frac{2 - x^{1/3}}{x^{1/3}}$

$B'(x) = DNE$

domain

$x \neq 0$

$\frac{0}{1} = \frac{2 - x^{1/3}}{x^{1/3}}$



$0 = 2 - x^{1/3}$

$(x^{1/3})^3 = (2)^3$

$x = 8$

Dec $(-\infty, 0) \cup (8, \infty)$

Inc $(0, 8)$

local min $(0, 0)$

local max $(8, 4)$

Concave up $(-\infty, 0)$

Concave down $(0, \infty)$

$(0, 0)$ inflection point

$B'(x) = 2x^{-1/3} - 1$

$B''(x) = -\frac{2}{3}x^{-4/3} = \frac{-2}{3x^{4/3}}$

$f''(x) = DNE$

Down | Down 0 | Down

$x \neq 0$

$\frac{0}{1} = \frac{-2}{3x^{4/3}}$

$0 \neq -2$ ← no inflection values