Tuesday, October 30, 2018 9:24 AM

(41) $f(x) = x^2 - x^{1/2}$

$f'(x) = 2x - \frac{1}{2}x^{-1/2}$

$2x - \frac{1}{2\sqrt{x}} = 0$

$2x = \frac{1}{2\sqrt{x}}$

$4x^{3/2} = 1$

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

$x^3 = \frac{1}{16}$

$x = \sqrt[3]{\frac{1}{16}}$

$x = 0$ critical point + $\sqrt[3]{\frac{1}{16}}$

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

$= 2 + \frac{1}{4\sqrt{x^3}} = 0$

$\sqrt[3]{\frac{1}{16}} = 0.39$

-.5

$x = 0$

no I?

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

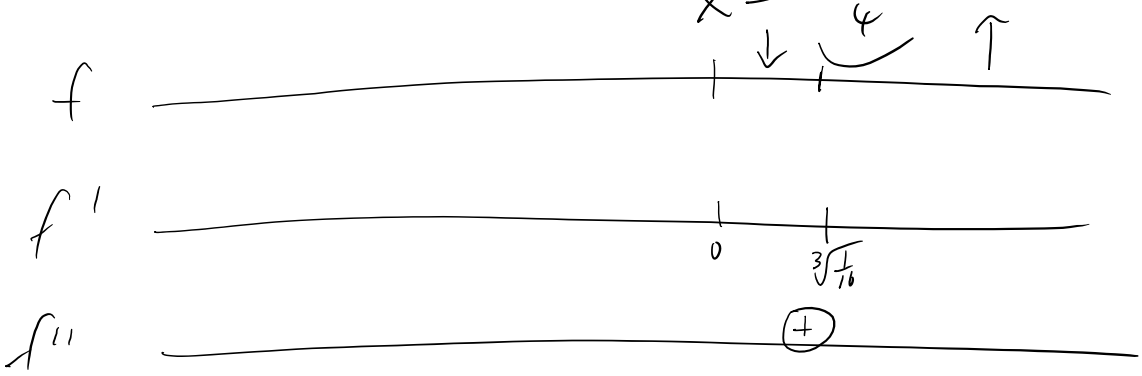
$-8\sqrt{x^3} = 1$

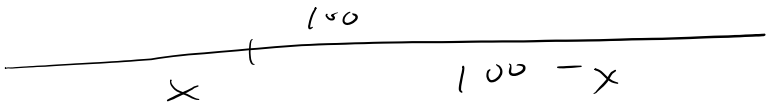
$\sqrt{x^3} = -\frac{1}{8}$

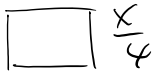
$x^3 = \frac{1}{64}$

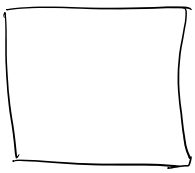
$x = \frac{1}{4}$

$f(\sqrt[3]{\frac{1}{16}})$ is a MIN









sum of 2 areas $= \left(\frac{x}{4}\right)^2 + \left(\frac{100-x}{4}\right)^2$

$q(x) = \frac{x^2}{16} + \frac{10{,}000 - 200x + x^2}{16} = \frac{x^2 - 100x + 5000}{8}$

$q'(x) = \frac{x}{4} - \frac{100}{8} = 0 \qquad x = 4\left(\frac{100}{8}\right) = 50$

$q''(x) = \frac{1}{4}$

(3) $x + \frac{1}{x} = f(x)$

$f'(x) = 1 - x^{-2} = 0$

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

critical points $= 1$

$f''(x) = 2x^{-3} = \frac{2}{x^3} > 0$

MIN