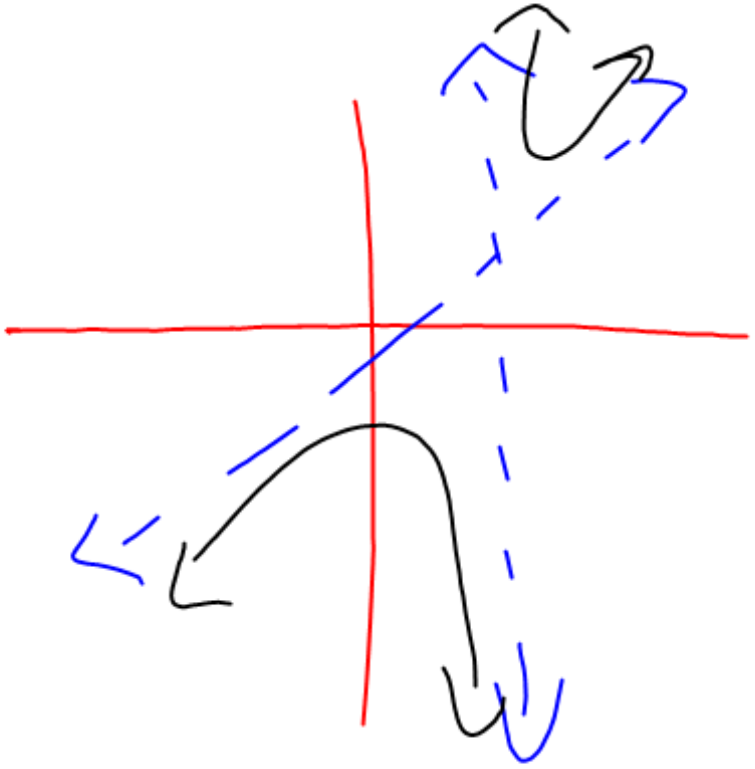
$$y = \frac{2x^2 - 5x + 5}{x - 2}$$

C.P. = .75
3.225

P.O.I =



3.7

Find Maximum Volume

Design an open box having a square base with a surface area of 108 square inches. What dimensions will produce a box with a maximum volume?

1) what is being maximized or min? Volume! Primary Equation

$V = x^2 h$

2) Find Secondary Equation

Surface Area = 108

$S = x^2 + 4xh$

$108 = x^2 + 4xh$

3) Solve for one of your variables in the Secondary EQ

$\frac{108 - x^2}{4x} = h$

4) Plug ↑ into PE.

$V = x^2\left(\frac{108 - x^2}{4x}\right)$

$V = \frac{108x^2 - x^4}{4x}$

$V = 27x - \frac{1}{4}x^3$

5) $V' = 27 - \frac{3}{4}x^2$

6) Find C.P. $0 = 27 - \frac{3}{4}x^2$

$-27 = -\frac{3}{4}x^2$

$36 = x^2$

$x = 6$

7) $h = \frac{108 - x^2}{4x}$

$h = \frac{108 - 36}{24}$

$= 3$

Dim

* Check Endpoints & C.P. $V = 27x - \frac{1}{4}x^3$

$V(0) = 0$ $V(6) = 108$ $V(\sqrt{108}) = 0$

6 x 6 x 3

Quiz → Graph

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