

Max Volume?

$$\begin{aligned}
 V(x) &= x(10 - 2x)\left(\frac{15 - 2x}{2}\right) \\
 &= (10x - 2x^2)\left(\frac{15 - 2x}{2}\right) \\
 &= (10x - 2x^2)\left(\frac{15}{2} - x\right) \\
 &= 10x\left(\frac{15}{2}\right) - 10x^2 - 2x^2\left(\frac{15}{2}\right) + 2x^3 \\
 &= 75x - 10x^2 - 15x^2 + 2x^3
 \end{aligned}$$

$$V(x) = 2x^3 - 25x^2 + 75x$$

b) Domain x -values that make sense

$$\begin{aligned}
 w &= 10 - 2x \\
 h &= x \\
 l &= \frac{15 - 2x}{2}
 \end{aligned}
 \quad \left. \vphantom{\begin{aligned} w \\ h \\ l \end{aligned}} \right\} 0 < x < 5$$

c) Use Desmos look @ the graph between $0 < x < 5$

$$\begin{aligned}
 V(x) & \\
 \text{Volume} &\approx 66 \text{ in}^3 \\
 x &\approx 1.96 \text{ in}
 \end{aligned}$$

$$d) V(x) = 2x^3 - 25x^2 + 75x$$

$$V'(x) = 6x^2 - 50x + 75$$

$$x = 1.96$$

$$x = 6.37$$

From (b) the domain $\Rightarrow 0 < x < 5$

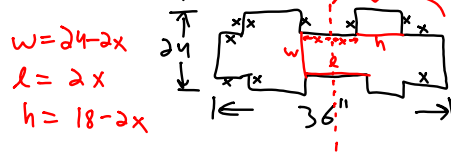
$$\therefore x \neq 6.37$$

$$x = 1.96$$

$$V(1.96) = 2(1.96)^3 - 25(1.96)^2 + 75(1.96)$$

$$V(1.96) = 66.02 \text{ in}^3$$

19) $V(x)$ want max Volume



Finish #19 for HW 12/3/13