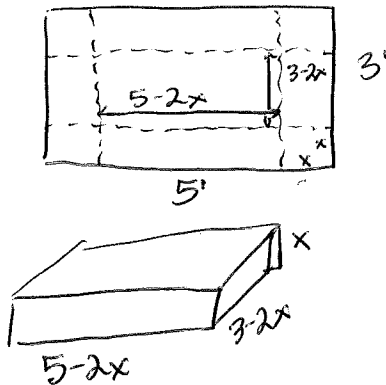


Welding

Maximizing Volume Quiz

Name KEY

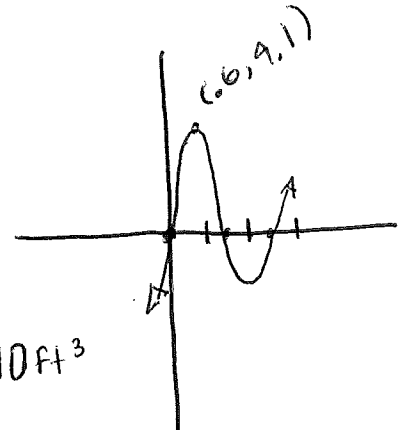
1. Using a 3' x 5' sheet of metal, make a container with the largest volume possible. Convert the volume to gallons using 1 cubic foot (fluid) = 7.4805 gallons.



$$\begin{aligned} V &= lwh \\ V &= (5-2x)(3-2x)(x) \\ V &= (15-16x+4x^2)(x) \\ V &= 15x-16x^2+4x^3 \\ V &= 4x^3-16x^2+15x \end{aligned}$$

Max Volume is 4.10 ft³
when $x = .6$ ft

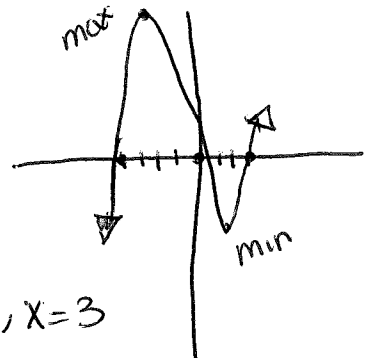
$$\boxed{4.1 \text{ ft}^3 \times \frac{7.4805 \text{ gallons}}{1 \text{ ft}^3} = 30.67 \text{ gal}}$$



2. Express the polynomial $y = x(x+4)(x-3)$ in standard form and graph it. Find the relative maximum, relative minimum, and zeros.

$$\begin{aligned} y &= x(x+4)(x-3) \\ y &= x(x^2+4x-3x-12) \\ y &= x(x^2+x-12) \\ y &= x^3+x^2-12x \end{aligned}$$

Max (-2.4, 20.7)
Min (1.7, -12.6)
Zeros $x = -4, x = 0, x = 3$



3. Graph the polynomial $y = x^3 + 5x^2 - 14x$. Find the relative maximum, relative minimum, and zeros.

Max (-4.4, 73.2)
min (1.06, -8.0)
Zeros $x = -7, x = 0, x = 2$

