

$$30) \left(x^2 - \frac{3}{x} = 7\right) \cdot x$$

$$x^3 - 3 = 7x$$

$$y. \quad x^3 - 7x - 3 = 0$$

x-int

$$x \approx -2.598 \quad x \approx -0.441$$

$$x \approx 2.838$$

$$35) \text{ Min} \\ A = 182 \text{ ft}$$

$$A = l \cdot w$$

$$\frac{182}{w} = \frac{l \cdot w}{w}$$

$$l = \frac{182}{w}$$

$$P = 2l + 2w$$

$$P = 2\left(\frac{182}{w}\right) + 2w$$

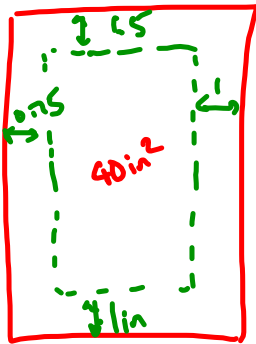
$$P = \frac{364}{w} + 2w$$

(w, P)

$$w = 13.4, \quad 53.6 = P$$

36)

$$A = 40 \text{ in}^2 \\ x \cdot \frac{40}{x}$$



$$A = (x + 0.75 + 1) \left(\frac{40}{x} + 1.5 + 1\right)$$

in calc find y,
Min

$$x \approx 5.29$$

so 7.04 wide x 10.06 high

$$A = 70.832 \text{ in}^2$$

37)

$$V = \pi r^2 h$$

hint $0.5L = 500 \text{ cm}^3$

$$S = 2\pi r^2 + 2\pi r h$$

$$S = 2\pi r^2 + 2\pi r \left(\frac{V}{\pi r^2}\right)$$

$$h = \frac{V}{\pi r^2} *$$

2 ans

$$\textcircled{1} r = 1.12, h = 126.88 \text{ cm}$$

$$\textcircled{2} r = 11.37, h = 1.23 \text{ cm}$$

$$a) S = 2\pi r^2 + 2\frac{V}{r}$$

$$900 = 2\pi r^2 + 2\left(\frac{500}{r}\right)$$

$$0 = 2\pi r^2 + \frac{1000}{r} - 900$$

(r, S)

2.8 Solving Inequalities in One Variable

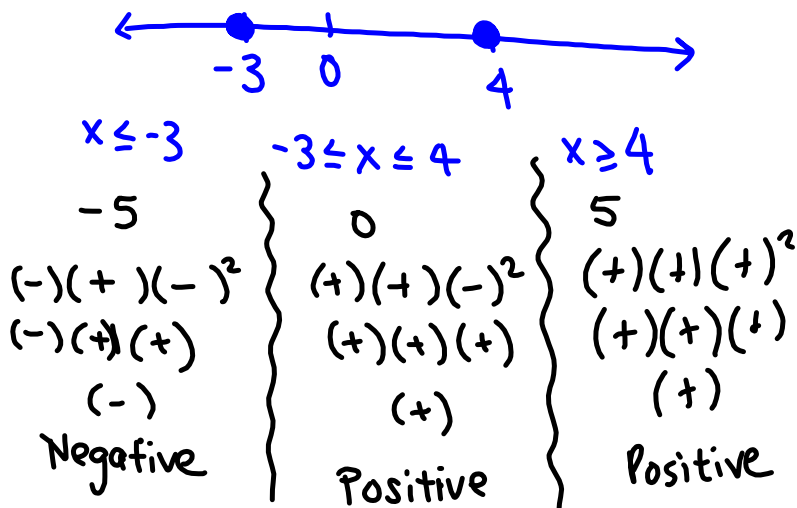
EXAMPLE 1 Finding where a Polynomial is Zero, Positive, or Negative

Let $f(x) = (x + 3)(x^2 + 1)(x - 4)^2$. Determine the real number values of x that cause $f(x)$ to be (a) zero, (b) positive, (c) negative.

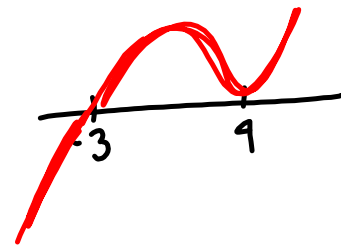
a) zeros (ZPP)

$$x = -3, x = 4 \quad \text{mult. 2}$$

from here create a sign chart



$$f(x) = (x+3)(x^2+1)(x-4)^2$$



b) Function is positive
@ $(-3, 4) \cup (4, \infty)$

c) Function is negative
@ $(-\infty, -3)$

p 264

2, 4, 5

$$\# 2) f(x) = (x-7)(3x+1)(x+4)$$

$$4) f(x) = (5x+3)(x^2+6)(x-1)$$

$$5) f(x) = (2x^2+5)(x-8)^2(x+1)^3$$