

3.6 #15-39 odd Solving polynomial inequalities
 #47, 53-61 odd Solving rational inequalities
 3.7: #23-37 odd Variation

$$\begin{array}{r} -1 \mid 1 \quad 0 \quad -9 \quad 4 \quad 12 \\ \quad \quad -1 \quad 1 \quad 8 \quad -12 \\ \hline \quad \quad 1 \quad -1 \quad -8 \quad 12 \quad \boxed{0} \end{array}$$

$$f(x) = (x+1)(x^3 - x^2 - 8x + 12) = (x+1)(x+3)(x^2 - 4x + 4)$$

$$\begin{array}{r} -3 \mid 1 \quad -1 \quad -8 \quad 12 \\ \quad \quad -3 \quad 12 \quad -12 \\ \hline \quad \quad 1 \quad -4 \quad 4 \quad \boxed{0} \end{array}$$

$$(x-2)^2$$

$$\begin{aligned} &x^3 - 3x^2 - x + 3 \\ &x^2(x-3) - 1(x-3) \\ &(x-3)(x^2-1) \\ &\quad (x-1)(x+1) \\ &z: -1, 1, 3 \end{aligned}$$

$$f(x) = \frac{x-4}{(x-2)(x+1)}$$

$$\frac{3x^3}{x^2} = 3x$$

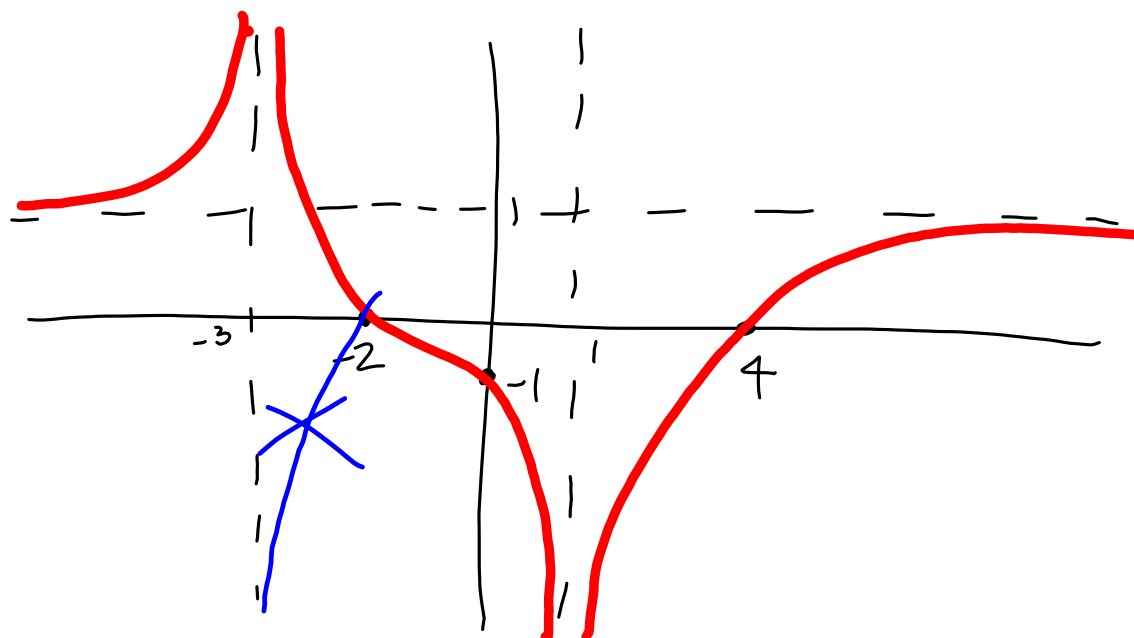
$$y = 3x$$

$$(x+6)(x-4)$$

V.A.

$$x = -6$$

$$x = 4$$



$$z: -2, 6, \frac{1}{2}$$

$$m: 3, 1, 2$$

$$-\frac{1}{3} \cdot X^3 \cdot X \cdot X^2 = -\frac{1}{3} X^6$$

$$+\frac{1}{3} (2)^3 (+6) \left(-\frac{1}{2}\right)^2$$

$$\frac{1}{3} \cdot 8 \cdot 6 \cdot \frac{1}{4} = 4$$

$$(0, 4)$$

3.6

64. Solve the inequality.

$$\frac{2x}{x^2-9} + \frac{x}{x^2+x-12} \geq \frac{3x}{x^2+7x+12}$$

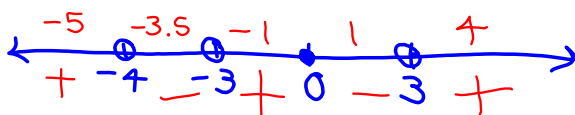
$$\frac{2x}{x^2-9} + \frac{x}{x^2+x-12} - \frac{3x}{x^2+7x+12} \geq 0$$

$$\frac{2x}{(x-3)(x+3)} \frac{(x+4)}{(x+4)} + \frac{x}{(x+4)(x-3)} \frac{(x+3)}{(x+3)} - \frac{3x}{(x+4)(x+3)} \frac{(x-3)}{(x-3)} \geq 0$$

$$\frac{2x(x+4) + x(x+3) - 3x(x-3)}{(x-3)(x+3)(x+4)} \geq 0$$

$$\frac{2x^2 + 8x + x^2 + 3x - 3x^2 + 9x}{(x-3)(x+3)(x+4)} \geq 0$$

$$\frac{20x}{(x-3)(x+3)(x+4)} \geq 0$$



$$(-\infty, -4) \cup$$

$$(-3, 0] \cup$$

$$(3, \infty)$$

$$36. \quad x^5 + 24 > 3x^3 + 8x^2$$

$$\left. \begin{aligned} a^3 + b^3 &= (a+b)(a^2 - ab + b^2) \\ a^3 - b^3 &= (a-b)(a^2 + ab + b^2) \end{aligned} \right\}$$

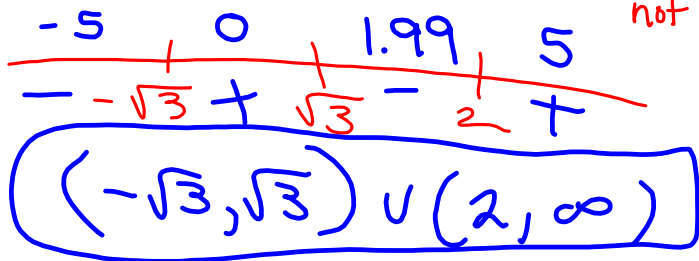
$$x^5 - 3x^3 - 8x^2 + 24 > 0$$

$$x^3(x^2 - 3) - 8(x^2 - 3) > 0$$

$$(x^2 - 3)(x^3 - 8) > 0$$

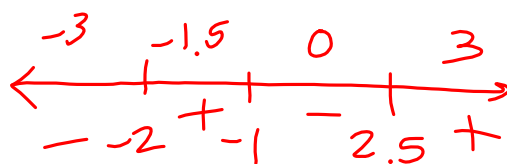
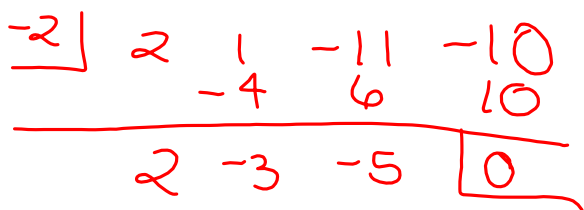
$$(x - \sqrt{3})(x + \sqrt{3})(x - 2)(x^2 + 2x + 4)$$

not factorable over \mathbb{R}



$$38. \quad 2x^3 + x^2 < 10 + 11x$$

$$2x^3 + x^2 - 11x - 10 < 0$$



$$(x + 2)(2x^2 - 3x - 5) < 0$$

$$2x^2 + 2x - 5x - 5$$

$$2x(x + 1) - 5(x + 1)$$

$$(x + 2)(x + 1)(2x - 5)$$

$$2(x + 2)(x + 1)(x - \frac{5}{2}) < 0$$

