

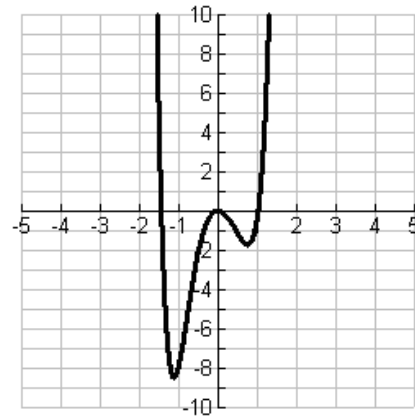
2.8 Solving Inequalities in One Variable

when solving an inequality - your answer is the x values for where the function (y values) meets the given conditions

$$f(x) > 0$$

report the x values for where the y's are greater than zero

$$(-\infty, -1.5) \cup (1, \infty)$$



A full graph is not needed to do this so we use a **sign chart**.

(A sign chart shows only the items related to the signs of the function.)

What are the important items in a graph?

$$(x + 3)(x - 2)(x + 2)^2 \geq 0$$



Polynomial Inequalities

32

goal: solving where the polynomial is (+) or (-)

Everything on 1 side and factored

Find all x-intercepts

Plot using open & closed holes according to the inequality sign

Find the signs of the graph in the intervals b/w the intercepts (use a value in the interval)

Answer: the intervals according to the inequality signs (use the union symbol if more than 1 interval)

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

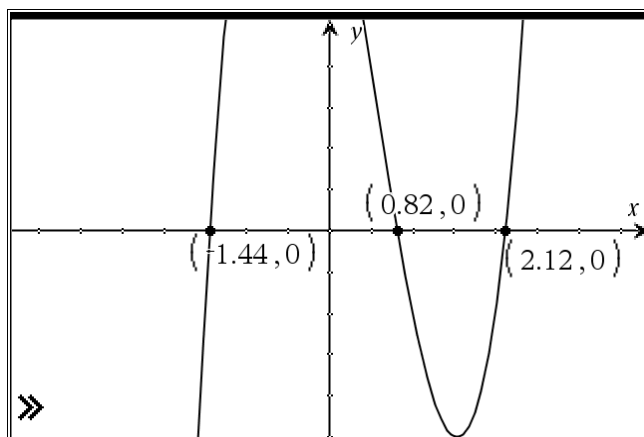
$$(x - 3)(x + 4)^2 (x - 1)^3 \geq 0$$



Solve the polynomial inequality graphically.

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

When asked to solve graphically - use your calculator to find the x-intercepts - then give the appropriate intervals based on the question.



Making Sign Chart for a Rational Function

$$\frac{(2x + 1)}{(x + 3)(x - 1)}$$

Rational Inequalities

#33

goal: to find where the graph is (+) or (-) depending on the inequality sign (remember to flip sign if multiply or divide by (-)

1. Get everything on one side and zero on the other
2. find LCD
3. Simplify the "everything" side into 1 fraction (not clearing fractions)
4. find x-intercepts - plot with open or closed holes depending on inequality signs
5. find restrictions (VA) - plot with open holes on line or if cross off undefined interval
6. use test point in intervals to find signs
7. Write answer in interval notation

$$\frac{x-2}{x} < \frac{x-4}{x-6}$$

$$\frac{x-5}{(2x-3)(x+2)} \geq 0$$



$$\frac{\sqrt{x-3}}{(2x+1)(x-4)} < 0$$

