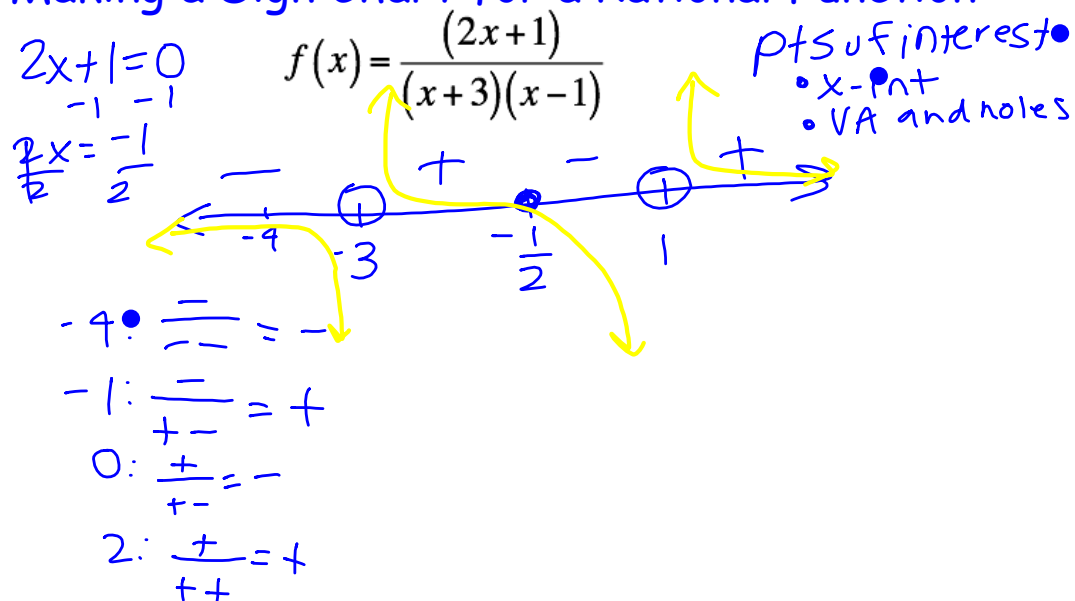


7-3 Solving Rational Inequalities

Making a Sign Chart for a Rational Function



Rational Inequalities

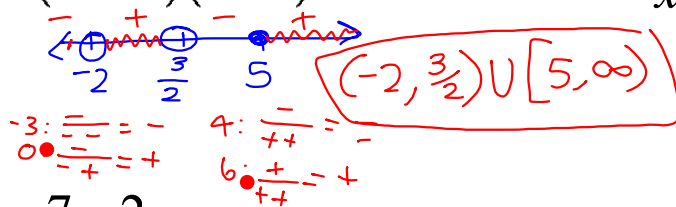
goal: to find where the graph is (+) or (-) depending on the inequality sign (remember to flip sign if multiply or divide by (-))

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 excluded values (VA) - plot with open holes on line or cross off undefined interval
6. Make a sign chart by testing points in each interval
7. Write answer in interval notation

Solve the rational inequalities

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

B) $\frac{2x-1}{x-2} \geq 1$



C) $\frac{7-2x}{x+3} \leq -2$

$\frac{7-2x}{x+3} + 2 \leq 0$

$\frac{7-2x+2x+6}{x+3} \leq 0$

$\frac{13}{x+3} \leq 0$



$-9: \frac{+}{-} = -$
 $0: \frac{+}{+} = +$

Solution: $(-\infty, -3)$

Solve the rational inequalities

Never multiply both sides of an inequality by a variable!

D) $\frac{x-2}{x} < \frac{x-4}{x-6} \rightarrow \frac{x-2(x-6)}{x(x-6)} < \frac{x-4}{x(x-6)}$

$x^2 - 8x + 12 < x^2 + 4x$

$x(x-6)$

$\frac{-9x+12}{x(x-6)} < 0 \rightarrow \frac{-4(x-3)}{x(x-6)}$



$-1: \frac{+}{-} = -$
 $2: \frac{+}{+} = +$
 $4: \frac{-}{-} = +$
 $7: \frac{-}{+} = -$

Solution: $(0, 3) \cup (6, \infty)$

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