

Solving a Rational Inequality example:

1) Need this form

$$\frac{\text{Single fraction}}{} > 0$$

or

$$\frac{\text{Single fraction}}{} < 0$$

Example: $\frac{4}{x+5} > \frac{1}{2x+3}$

$$\frac{4}{x+5} - \frac{1}{2x+3} > 0$$

$$\text{LCD} = (x+5)(2x+3)$$

$$\frac{4(2x+3)}{(x+5)(2x+3)} - \frac{1(x+5)}{(x+5)(2x+3)} > 0$$

$$\frac{7x+7}{(x+5)(2x+3)} > 0$$

2) Set numerator and denominator = 0 (find critical numbers)

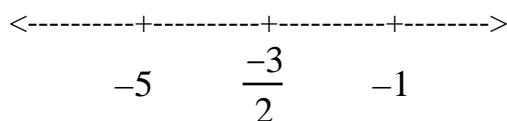
$$7x + 7 = 0 \quad (x+5) = 0 \quad (2x+3) = 0$$

$$x = -1$$

$$x = -5$$

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

(put these numbers on a number line)



Test points: (use calculator here !)

$$(x = -6): \quad \frac{7(-6) + 7}{(-6+5)(2(-6)+3)} = \frac{-}{+} = - \text{ negative (no solution)}$$

$$(x = -4): \quad \frac{7(-4) + 7}{(-4+5)(2(-4)+3)} = \frac{-}{-} = + \text{ positive (yes solution)}$$

$$(x = -1.4): \quad \frac{7(-1.4) + 7}{(-1.4+5)(2(-1.4)+3)} = \frac{-}{+} = - \text{ negative (no solution)}$$

$$(x = 0): \quad \frac{7(0) + 7}{(0+5)(2(0)+3)} = \frac{-}{-} = + \text{ positive (yes solution)}$$

3) Answer:

$$(-5, \frac{-3}{2}) \cup (-1, \infty)$$