

# Solving Rational Inequalities

- Combine everything into one fraction (common denominator).
- Find the zeros of the numerator and the denominator.
- Use these zeros as your cutpoints.
- Determine if the rational expression is positive or negative for each interval determined by the cutpoints.
- Carefully determine if each cutpoint is or is not a solution.

Example:

Solve the following inequality

$$\frac{x+1}{x-2} \leq 0 \quad x \neq 2$$



$$[-1, 2]$$

Example:

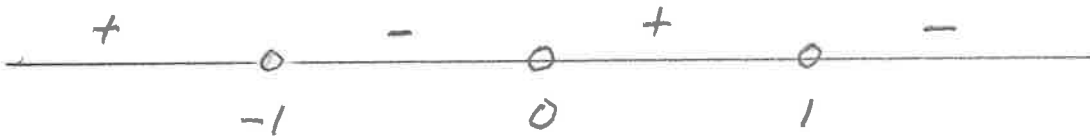
Solve the following inequality

$$\frac{2}{x+1} - \frac{3}{x} > \frac{3}{x} \quad x \neq -1, \quad x \neq 0$$

$$\frac{6}{(x+1)x} - \frac{3}{x} > 0$$

$$\frac{6 - 3(x+1)}{(x+1)x} > 0, \quad \frac{6 - 3x - 3}{(x+1)x} > 0$$

$$\frac{3 - 3x}{(x+1)x} > 0, \quad \frac{3(1-x)}{(x+1)x} > 0$$



$$(-\infty, -1) \cup (0, 1)$$

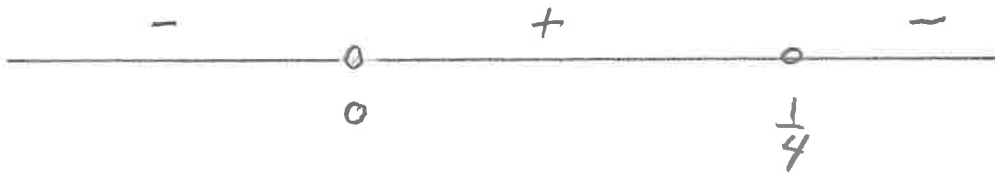
Example:

Solve the following inequality

$$\frac{1}{x} < 4$$

$$x \neq 0$$

$$\frac{1}{x} - 4 < 0 \quad , \quad \frac{1-4x}{x} < 0$$



$$(-\infty, 0) \cup \left(\frac{1}{4}, \infty\right)$$