Warm Up

In 1 - 3, solve each equation.

1. $4x - 7 = 2x + 3(5x - 1) - 9$ $x = 5/13$

2. $7x^2 + 34x = 5$ $x = 1/7,\ x = -5$

3. $\dfrac{8}{x+1} = 4$ $x = 1$

In 4 - 5, solve each inequality. Your solution should be given two ways: using interval notation and shown on a number line.

$5/13$ $(-\infty, 5/13)$

4. $4x - 7 > 2x + 3(5x - 1) - 9$ x $5/13$

$-7 \quad 7 \quad -12$

5. $7x^2 + 34x \le 5$ $[-5, 1/7]$

$-5 \quad 1/7$

Recall: The domain of linear and quadratic functions is all real numbers. So, what happens when you solve an inequality that is based on a function for which the domain is *NOT* all real numbers? So far in this course, we have studied two functions that fit this description. The domain of a rational function has at least one value excluded from its domain, and the domain of a square root function has a restriction. So, when solving a rational or a square root inequality, you must account for the fact that the function's domain is *NOT* all real numbers.

Notes: Solving Rational Inequalities

Solve each inequality. Answers should be given using interval notation. Use a number line to assist you.

1. $\frac{8}{x+1} > 4$

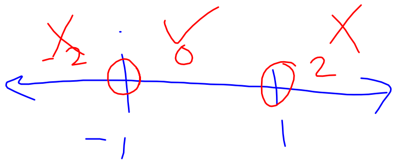
Solution $(-1, 1)$

① Identify exclusions from domain

$x \neq -1$

Solve $\frac{8}{x+1} = 4 \rightarrow x = 1$

② Solve related equation



③ These values are our critical values

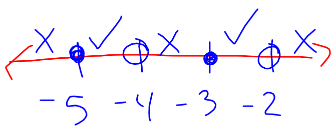
④ Test a point in each interval to determine solution.

6. $\frac{3x}{x+2} - \frac{2}{x+4} \geq 7$

① exclusions: $-2, -4$

② Solve:

$$\frac{3x}{x+2}^{(x+4)} - \frac{2}{x+4}^{(x+2)} = 7^{(x+4)(x+2)}$$



$[-5, -4) \cup [-3, -2)$

$3x^2 + 12x - 2x - 4 = 7x^2 + 42x + 56$

$x = -3, -5$