

4.7 More Equations and Inequalities

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Solving Rational Equations

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- Solve $\frac{3x}{2x-1} = 3$
- Solve $\frac{1}{x^2} + \frac{1}{x} = 2$
- Solve $\frac{4}{x-2} = \frac{3}{x-1}$
- Solve $\frac{2x}{x-1} = 5 + \frac{2}{x-1}$



Procedure to solve inequalities algebraically

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1. Get a 0 on one side of the inequality
2. Factor completely (numerator & denominator)
3. Plot the roots of all factors on a number line
4. Pick a value from each interval on the number line and plug it into the expression to find the sign
5. Choose the intervals carrying the appropriate sign
6. Write your answer in interval notation

Remember!

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In a rational function, the zeros of the denominator **CANNOT** be included in the solution set ever.



Examples

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- Solve $8x^3 < 27$
- Solve $2x^3 \leq 3x^2 + 5x$
- Solve $4x^4 - 5x^2 - 9 \geq 0$



Examples

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- Solve $\frac{x}{x^2 - 1} \geq 0$

- Solve $\frac{x+1}{4-2x} \geq 1$

- Solve $\frac{3}{2-x} > \frac{x}{2+x}$



Example

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Given the graph of $f(x)$, solve the inequality $f(x) \leq 0$.

