Math 1050 ~ College Algebra
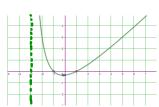
$-3x + 4y = 5$
$2x - y = -10$

$$\begin{bmatrix} -3 & 4 \\ 2 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ -10 \end{bmatrix}$$

$$\sum_{k=1}^{m} k = \frac{m(m+1)}{2}$$

$$\sum_{k=0}^{n} z^k = \frac{1 - z^{n+1}}{1 - z}$$

15 Solving Rational Equations and Inequalities

Learning Objectives

- Solve rational equations.
- Solve rational inequalities graphically.
- Solve rational inequalities algebraically.
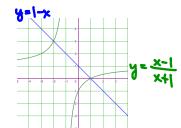
Solving Rational Equations and Inequalities

Ex 1: For each of these equations, determine the solution from the graph, then do the algebra to arrive at the same answer.
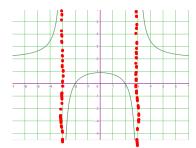
a) $\dfrac{x^2 - 1}{x + 3} = 3$

b) $\dfrac{x - 1}{x + 1} = 1 - x$

$y = 1 - x$

$y = \dfrac{x - 1}{x + 1}$

Ex 2: Determine the solution graphically and algebraically.
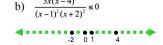

$$\frac{2x^2 - 8}{x^2 - 9} \le 0$$

Ex 3: Solve algebraically.
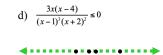
a) $\dfrac{3x}{x-1} \ge \dfrac{x}{x+4} + 3$

b) $\dfrac{(x-2)(x+1)^2}{x(x+1)} \ge 0$

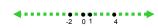Ex 4: For each of these inequalities, fill in a sign line.

a) $\dfrac{3x(x-4)}{(x-1)(x+2)^2} \le 0$

-2   0 1   4

b) $\dfrac{3x(x-4)^3}{(x-1)^2(x+2)^2} \le 0$

-2   0 1   4

c) $\dfrac{3x(x-4)}{(x-1)^2(x+2)^2} \le 0$

-2   0 1   4

d) $\dfrac{3x(x-4)}{(x-1)^3(x+2)^2} \le 0$

-2   0 1   4

e) $\dfrac{3x(x-4)^2}{(x-1)^2(x+2)^2} \le 0$

-2   0 1   4

Ex 5: A rectangular parking lot with a perimeter of 360 m is to have an area of at least 8000 m². Within what bounds must the length of the rectangle be?