

MATH 6 CLASSWORK 22

May 5, 2024

# Inequalities and Equations with Inequalities

$$a < b$$

What will happen if we multiply both sides by -1? Lets take a look at some examples ....

$$3 < 5, \quad \text{after multiplying by -1} \quad \Rightarrow \quad -3 > -5$$

$$a < b \quad \Leftrightarrow \quad -a > -b$$

Example:

Solve inequality

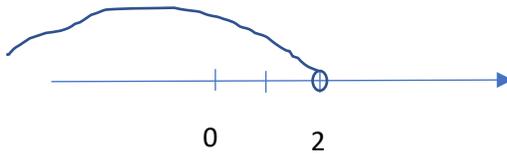
$$-3x > -6$$

Multiply by -1

$$3x < 6$$

Divide by 3

$$x < 2$$



$$ab = 0$$

$$a = 0 \text{ OR } b = 0$$

$$ab > 0$$

$$\begin{matrix} \begin{cases} a > 0 \\ b > 0 \end{cases} & \text{OR} & \begin{cases} a < 0 \\ b < 0 \end{cases} \\ \text{Both positive} & \text{OR} & \text{both negative} \end{matrix}$$

$$ab < 0$$

$$\begin{matrix} \begin{cases} a > 0 \\ b < 0 \end{cases} & \text{OR} & \begin{cases} a < 0 \\ b > 0 \end{cases} \\ \text{One is positive and one is negative} \end{matrix}$$

$$(x - 1)(x - 2) > 0$$

$$\begin{matrix} \begin{cases} x - 1 > 0 \\ x - 2 > 0 \end{cases} & \text{OR} & \begin{cases} x - 1 < 0 \\ x - 2 < 0 \end{cases} \end{matrix}$$

$$\begin{matrix} \begin{cases} x > 1 \\ x > 2 \end{cases} & \text{OR} & \begin{cases} x < 1 \\ x < 2 \end{cases} \end{matrix}$$

## MATH 6 HOMEWORK 22

April 21, 2024

1. Solve the following inequalities, draw solution on the number line
  - a.  $-x < 2$
  - b.  $2 - 3x > 5$
  - c.  $3x + 1 < 5x + 7$
  - d.  $1 + 5x < 3x$
  - e.  $2x - 1 < x - 7$
  
2. Solve the following equations and inequalities:
  - a.  $(x - 1)(x - 2) = 0$
  - b.  $(x - 1)(x - 2) < 0$
  - c.  $(x + 1)(x - 2) > 0$
  
3. On the quadrille paper plot the graphs below. Notice that lines are shifted along y axis
  - a. On the same cartesian XY plane:
    - i.  $y = x$
    - ii.  $y = x + 5$
    - iii.  $y = x - 3$
  - b. On the same cartesian XY plane:
    - i.  $y = 2x$
    - ii.  $y = 2x + 3$
    - iii.  $y = 2x - 2$
  - c. On the same cartesian XY plane:
    - i.  $y = -2x$
    - ii.  $y = -2x + 1$
    - iii.  $y = -2x - 4$
  
4. Plot
  - i.  $y = |x|$
  - ii.  $y = |x| + 2$
  - iii.  $y = |x + 2|$