MATH 6 CLASSWORK 22

April 18, 2021

Inequalities and Equations with Inequalities

$$a < b$$

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

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

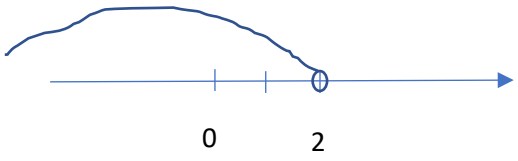
Conclusion ….

$$\boldsymbol{a < b} \quad \Longleftrightarrow \quad \boldsymbol{-a > -b}$$

Solve inequality $\mathbf{-3x > -6}$

Multiply by -1 $\mathbf{3x < 6}$

Divide by 3 $\mathbf{x < 2}$



$$\boldsymbol{ab = 0}$$

$$a = 0 \quad OR \quad b = 0$$

$$\boldsymbol{ab > 0}$$

$\begin{cases} \boldsymbol{a > 0} \\ \boldsymbol{b > 0} \end{cases}$ OR $\begin{cases} \boldsymbol{a < 0} \\ \boldsymbol{b < 0} \end{cases}$

Both positive OR both negative

$$\boldsymbol{ab < 0}$$

$\begin{cases} \boldsymbol{a > 0} \\ \boldsymbol{b < 0} \end{cases}$ OR $\begin{cases} \boldsymbol{a < 0} \\ \boldsymbol{b > 0} \end{cases}$

One is positive and one is negative

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

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

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

MATH 6 HOMEWORK 24

May 1, 2022

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 plot:
      i. $y = x$
      ii. $y = x + 5$
      iii. $y = x - 3$
   b. On the same cartesian XY plane plot:
      i. $y = 2x$
      ii. $y = 2x + 3$
      iii. $y = 2x - 2$
   c. On the same cartesian XY plane plot:
      i. $y = -2x$
      ii. $y = -2x + 1$

4. Plot $y = |x + 3|$
5. Simplify (*First simplify inside parenthesis, then do the powers*):

(a) $\left(\frac{6a^2b^5}{4a^3b^3}\right)^3 =$ (b) $\left(2z^2 \cdot 5z^5 \cdot z\right)^2 =$ (c) $\frac{(-ab)^8}{(a^4b)^2} =$

(d) $\left(\frac{3ab^3}{15b}\right)^2 \cdot \frac{25c}{a^2b^6} =$ (d) $\left(\frac{3a^5b^2}{21ab}\right)^2 \cdot \frac{7^4}{a^{16}b^2} =$

6. You throw a coin 5 times. What is the probability to get TTHTT? HHHTT?