4.3 Solving Inequalities using multiplication & division

EQ: How can we use multiplication and division to solve inequalities?

Multiplication and Division property of inequality: when you multiply or divide by the same number to both sides, the inequality remains true.

EXCEPTION: when you multiply or divide by the same **Negative** number to both sides, **Flip the sign**

Example 1: Solve & graph $\frac{x}{5} \leq -3$

$5 \cdot \frac{x}{5} \leq -3 \cdot 5$

$x \leq -15$

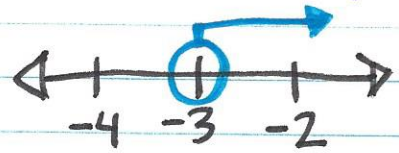
* draw line for balance
* 3 Qs
  1. x
  2. ÷5
  3. x5

Example 2: Solve and graph. $6x > -18$

$\frac{6x}{6} > \frac{-18}{6}$

$x > -3$

1. x
2. x6
3. ÷6



Example 3: $-2 \cdot -\frac{1}{2}n \leq 6 \cdot -2$

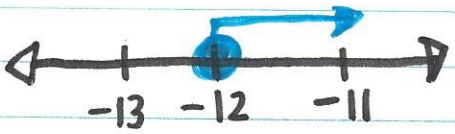
$n \leq -12$ flip the sign

$n \geq -12$

1. n
2. $\times -\frac{1}{2}$
3. $\div -\frac{1}{2}$

OR

$\times -2$



* we multiplied by -2 to both sides so I need to Flip the sign