7. 7 Solving Inequalities Using Multiplication or Division

ESSENTIAL QUESTION: How can you use multiplication or division to solve an inequality?

SOLVING INEQUALITIES USING MULTIPLICATION AND DIVISION

1)Get variable by itself by either multiplying or dividing on both sides just like you were solving an equation.

2)Answer will have a variable, inequality sign, and a number.

3)Graph your solution on a number line.

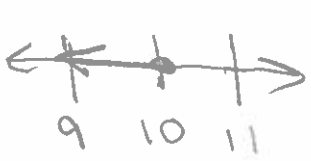
* < or > is an open circle
*≤ or ≥ is a closed circle

EXAMPLE 1->Solve an Inequality Using Multiplication

Solve the inequality. Graph the solution.

1) $\frac{x}{5} \leq 2$ · 5

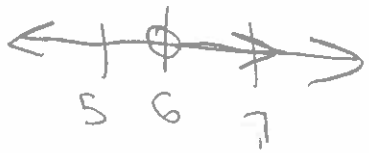
$x \leq 10$



2) $p \div 3 > 2$

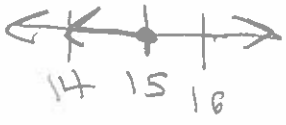
$2 \cdot \frac{p}{3} > 2 \cdot 3$

$p > 6$



3) $\frac{3}{5}q \leq 9$ · 5 · 3

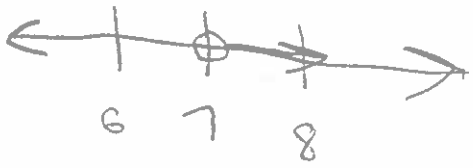
$q \leq 15$



4) $1 < \frac{s}{7}$ · 7

$7 < s$

$s > 7$



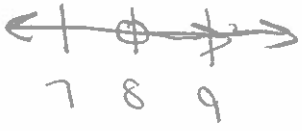
EXAMPLE 2->Solve an Inequality Using Division

Solve the inequality. Graph the solution.

1) $4n > 32$

$\frac{4n}{4} > \frac{32}{4}$

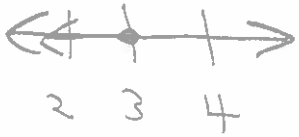
$n > 8$



2) $11k \leq 33$

$\frac{11k}{11} \leq \frac{33}{11}$

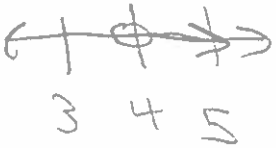
$k \leq 3$



3) $5 \cdot j > 20$

$\frac{5j}{5} > \frac{20}{5}$

$j > 4$

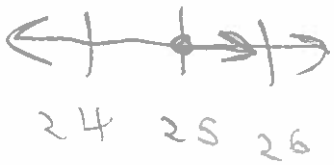


4) $50 \leq 2m$

$\frac{50}{2} \leq \frac{2m}{2}$

$25 \leq m$

$m \geq 25$



EXAMPLE 3->Real Life Application

1)A one-way bus ride costs $1.75. A 30-day bus pass cost $42.

a)Write and solve an inequality to find the least number of one-way rides you must take for the 30-day pass to be a better deal.

$\frac{1.75r}{1.75} \geq \frac{42}{1.75}$

$r \geq 24$

You need to take more than 24 rides for the pass to be a better deal

b) You ride the bus an average of 20 times each month. Is the pass a better deal? Explain

No the cost of 20 1-way rides is less than $42.

2)The sign shows the toll for driving on Alligator Alley. Write and solve an inequality to represent the number of times someone can drive on Alligator Alley with $15.

$\frac{2.5x}{2.5} \leq \frac{15}{2.5}$

$x \leq 6$

The most someone can drive on Alligator Alley is 6 times