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<u>Intro</u>		
$<$	less than	"more than"
$\leq$	less than or equal to	"at most"
$>$	greater than	"less than"
$\geq$	greater than or equal to	"at least"

Topic 1: Translating a sentence by using an inequality symbol

1. Translate the sentence "x is at least 5" into an inequality: $x \geq 5$.

$$x \geq 5$$

1. Write an inequality for "y is less than 12": $y < 12$.

$$y < 12$$

Topic 2: Translating a sentence into a one-step inequality

1. Translate "The number of books is more than 10" into an inequality: $b > 10$.

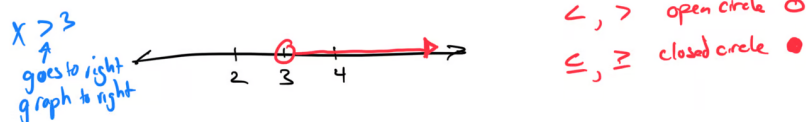
$$b > 10$$

1. Write an inequality for "The temperature is at most 30 degrees": $t \leq 30$.

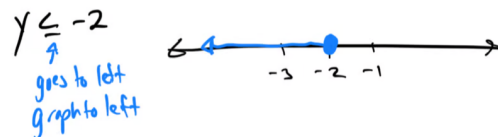
$$t \leq 30$$

Topic 3: Graphing a linear inequality on the number line

1. Graph the inequality $x > 3$ on a number line: Open circle at 3, arrow pointing right.

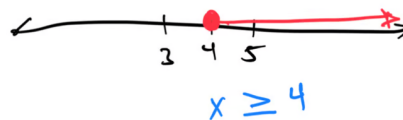


1. Graph the inequality $y \leq -2$ on a number line: Closed circle at -2, arrow pointing left.

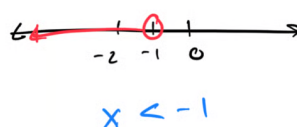


Topic 4: Writing an inequality given a graph on the number line

1. Write the inequality for a number line graph showing all numbers greater than or equal to 4: $x \geq 4$.

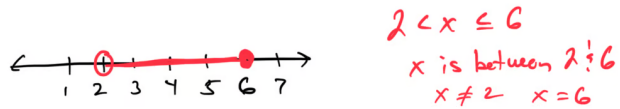


1. Write the inequality for a number line graph showing all numbers less than -1: $x < -1$.

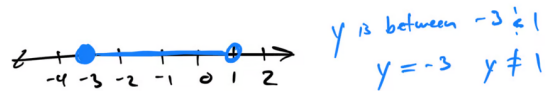


Topic 5: Graphing a compound inequality on the number line

1. Graph the compound inequality $2 < x \leq 6$ on a number line: Open circle at 2, closed circle at 6, shaded between.



1. Graph the compound inequality $-3 \leq y < 1$ on a number line: Closed circle at -3, open circle at 1, shaded between.



Topic 6: Additive property of inequality with whole numbers

1. Solve for x : $x + 4 > 7$: $x > 3$.

$$\begin{array}{r} x + 4 > 7 \\ -4 \quad -4 \\ \hline x > 3 \end{array}$$

If you divide (or multiply) by a negative, FLIP THE SIGN!

1. If $y + 8 \leq 15$, find the solution set for y : $y \leq 7$.

$$\begin{array}{r} y + 8 \leq 15 \\ -8 \quad -8 \\ \hline y \leq 7 \end{array}$$

Topic 7: Additive property of inequality with integers

1. Solve for x : $x + (-5) \geq 2$: $x \geq 7$.

$$\begin{array}{r} x - 5 \geq 2 \\ +5 \quad +5 \\ \hline x \geq 7 \end{array}$$

1. If $z + 3 < -4$, find the solution set for z : $z < -7$.

$$\begin{array}{r}
 z + 3 < -4 \\
 -3 \quad -3 \\
 \hline
 z < -7
 \end{array}$$

Topic 8: Multiplicative property of inequality with integers

1. Solve for x : $3x > 12$: $x > 4$.

$$\begin{array}{r}
 3x > 12 \\
 \frac{3}{3} \quad \frac{12}{3} \\
 \hline
 x > 4
 \end{array}$$

1. If $-2y \leq 8$, find the solution set for y : $y \geq -4$.

$$\begin{array}{r}
 -2y \leq 8 \\
 \frac{-2}{-2} \quad \frac{8}{-2} \\
 \hline
 y \geq -4
 \end{array}$$

Divide by negative
FLIP THE SIGN!

$$\begin{array}{r}
 2x > -6 \\
 \frac{2}{2} \quad \frac{-6}{2} \\
 \hline
 x > -3
 \end{array}$$

Topic 9: Solving a two-step linear inequality: Problem type 1

1. Solve for x : $2x + 5 < 11$: $x < 3$.

$$\begin{array}{r}
 2x + 5 < 11 \\
 -5 \quad -5 \\
 \hline
 2x < 6 \\
 \frac{2}{2} \quad \frac{6}{2} \\
 \hline
 x < 3
 \end{array}$$

1. If $3y - 4 \geq 8$, find the solution set for y : $y \geq 4$.

$$\begin{array}{r}
 3y - 4 \geq 8 \\
 +4 \quad +4 \\
 \hline
 3y \geq 12 \\
 \frac{3}{3} \quad \frac{12}{3} \\
 \hline
 y \geq 4
 \end{array}$$

check $y \geq 4$
 $y = 10$
 $3(10) - 4 \geq 8$
 $30 - 4 \geq 8$
 $26 \geq 8$ ✓

Topic 10: Solving a two-step linear inequality: Problem type 2

1. Solve for x : $-3x + 2 > 8$: $x < -2$.

$$\begin{aligned} -3x + 2 &> 8 \\ -2 & \quad -2 \\ \hline -3x &> 6 \\ \frac{-3x}{-3} & \frac{6}{-3} \\ x &< -2 \end{aligned}$$

1. If $4y - 7 \leq -3$, find the solution set for y : $y \leq 1$.

$$\begin{aligned} 4y - 7 &\leq -3 \\ +7 & \quad +7 \\ \hline 4y &\leq 4 \\ \frac{4y}{4} & \frac{4}{4} \\ y &\leq 1 \end{aligned}$$

Topic 11: Solving a linear inequality with multiple occurrences of the variable: Problem type 1

1. Solve for x : $5x - 2x + 4 > 10$: $x > 2$.

$$\begin{aligned} 5x - 2x + 4 &> 10 \\ \hline 3x + 4 &> 10 \\ -4 & \quad -4 \\ \hline 3x &> 6 \\ \frac{3x}{3} & \frac{6}{3} \\ x &> 2 \end{aligned}$$

1. If $-7y - 3y + 5 \leq 15$, find the solution set for y .

$$\begin{aligned} -7y - 3y + 5 &\leq 15 \\ \hline -10y + 5 &\leq 15 \\ -5 & \quad -5 \\ \hline -10y &\leq 10 \\ \frac{-10y}{-10} & \frac{10}{-10} \\ y &\geq -1 \end{aligned}$$

Divide by negative
FLIP THE SIGN

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