

Writing and Graphing Inequalities

Expressions vs. Equations vs. Inequalities

Expression:	Equation:	Inequality:
simplify	solve	solve
no equal sign	has an equal sign	$<, >, \leq, \geq$ symbols

Inequality Symbols

greater than $>$	less than $<$
greater than or equal to \geq	less than or equal to \leq

Inequality Vocabulary

$>$ Greater than More than Above	\geq No less than At least Minimum	\leq No more than At most Maximum	$<$ Is less than Fewer than
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Write an inequality for each situation described.

Chicago Blackhawks tickets are no more than \$1,666.67
(Let b = Blackhawks price)

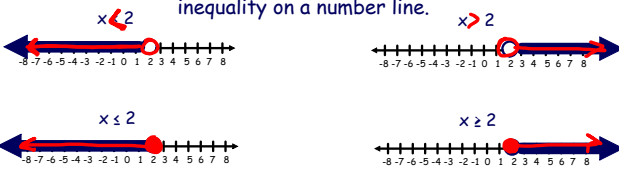
$$b \leq \$1,666.67$$

Carolina Hurricane tickets are a minimum of \$30.
(Let h = Hurricanes tickets)

$$h \geq \$30$$

Graphing Inequalities

An inequality solution is more than just one number, it is a range of values. To show the full solution, we graph the inequality on a number line.



$$x > 23$$

20 21 22 23 24

Graphing Inequalities

OPEN CIRCLE

- the number is NOT part of the solution
- used with the $>$ and $<$ symbols
- $x > 2$ $5 < y$ $z < -3.5$

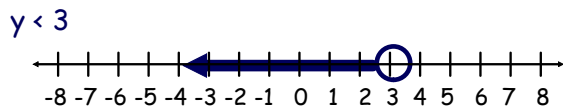
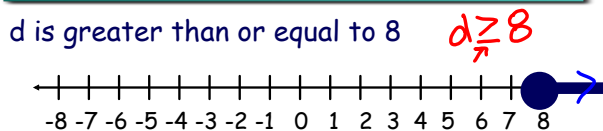
CLOSED CIRCLE

- the number IS part of the solution
- used with the \geq and \leq symbols
- $x \geq 1/2$ $y \leq -1$ $93 \geq z$

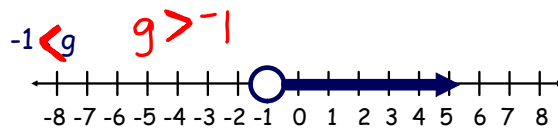
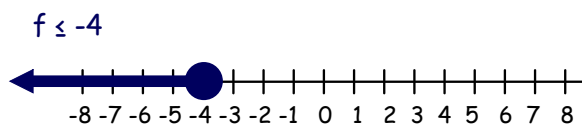
SHADING:

- choose a value on the number line other than number provided
- substitute the value into the inequality
- is the inequality true?
 - > if yes, shade in the direction of that number
 - > if no, shade in the opposite direction of that number

Graph the Solution



Graph the Solution



Writing Inequalities from a Graph



1st Step: Choose a variable. $x \leq 4$

2nd Step: Record the number below the circle.

3rd Step: Determine the correct inequality symbol.

Writing the Graph's Inequality



$x \leq 1$



$x > -3$

Multiplication and Division Properties of Inequalities

If you multiply or divide each side of an inequality by a positive number, you leave the inequality symbol the same.

$$\underline{7} < \underline{8} \text{ so } \underline{7}(2) < \underline{8}(2)$$

$$14 < 16$$

If you multiply or divide each side of an inequality by a negative number, you switch the inequality symbol.

$$\underline{8} > \underline{7} \text{ so } \underline{8}(-2) < \underline{7}(-2)$$

$$-16 < -14$$

*This is important to know when you begin solving inequalities!

$$\begin{array}{r} -2x + 4 > 10 \\ -4 \quad -4 \\ \hline -2x > 6 \\ \frac{-2x}{-2} > \frac{6}{-2} \\ x < -3 \end{array}$$

Attachments

mental math division.ppt