

Name _____ Date _____

Solving Inequalities (Pages 43–47)

An **inequality** is a mathematical sentence that compares quantities. Inequalities contain symbols like $>$ and $<$ instead of an equals sign. Unlike an equation, an inequality may have many solutions. The solution can be written as a set of numbers or graphed on a number line.

Translating Words into Inequalities	Words		Symbols	
		6 is greater than 4 b is less than or equal to 9 $2x + 9$ is greater than or equal to 12 $\frac{m}{3} - 5$ is less than 8		$6 > 4$ $b \leq 9$ $2x + 9 \geq 12$ $\frac{m}{3} - 5 < 8$
	$<$	$>$	\leq	\geq
Common Phrases and Corresponding Inequalities	<ul style="list-style-type: none"> less than fewer than up to 	<ul style="list-style-type: none"> greater than more than exceeds in excess of 	<ul style="list-style-type: none"> less than or equal to no more than at most 	<ul style="list-style-type: none"> greater than or equal to no less than at least

EXAMPLE

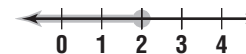
Solve $6x \leq 12$ and graph the solution on a number line.

$$6x \leq 12$$

$$\frac{6x}{6} \leq \frac{12}{6} \quad \text{Divide each side of the inequality by 6.}$$

$$x \leq 2$$

All values of x that are less than or equal to 2 are solutions to the inequality. This is indicated by a closed circle on the number line at 2, and an arrow going to the left.



Try These Together

Solve each inequality. Graph the solution on a number line.

1. $y - 5 < 3$

2. $6x \geq 30$

3. $f + 8 < 10$

HINT: When graphing, use a closed circle for \leq or \geq and an open circle for $<$ or $>$.

PRACTICE

Solve each inequality. Graph the solution on a number line.

4. $3g \geq 21$

5. $5h - 5 \leq 10$

6. $6 + q < 16$

7. $5 + k \leq 11$

8. $m - 8 > 1$

9. $3a \geq 9$



10. **Standardized Test Practice** Solve the inequality $\frac{x}{12} + 4 \leq 7$.

A $x \leq 48$

B $x \leq 11$

C $x \leq 36$

D $x \leq 9$

Answers: 1–9. See Answer Key for graphs. 1. $y < 8$ 2. $x \geq 5$ 3. $f < 2$ 4. $g \geq 7$ 5. $h \leq 3$ 6. $q < 10$ 7. $k \leq 6$ 8. $m > 9$ 9. $a \geq 3$ 10. C