Algebra 1

Lesson 6.1
Solve Inequalities Using
Addition and Subtraction

Warm-Up
Tell whether or not 5 is a solution for each of the following equations.

(a) $x+4=9$

$5+4=9$
$9=9$ ✓
YES

(b) $2n-1=7$

$2(5)-1=7$
$10-1=7$
$9\neq 7$
NO

(c) $4(y+1)=24$

$4(5+1)=24$
$4(6)=24$
$24=24$ ✓
YES

(d) $-2a-3=13$

$-2(5)-3=13$
$-10-3=13$
$-13\neq 13$
NO

Graphs of One Variable Inequalities

The solution is represented by the graph including the set of all points that are solutions to the inequality.

$<$ LESS THAN (LEFT)

$\leq$ LESS THAN OR EQUAL TO (LEFT)

$>$ GREATER THAN (RIGHT)

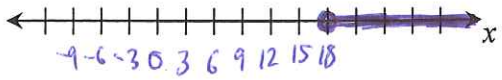
$\geq$ GREATER THAN OR EQUAL TO (RIGHT)

* THE CLOSED CIRCLE MEANS THE SOLUTIONS INCLUDE THE STARTING VALUE

Example 1. Write and Graph an Inequality (Assignment #3-5)

(a) For elections in the United States a person must be at least 18 years old to vote. Use this information to write and graph an inequality that describes the ages of all of the people able to vote in the United States.

$x \geq 18$

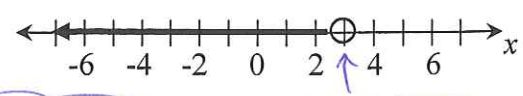


(b) In order to play in a certain section at Chuck E. Cheese children must be younger than 5 years old. With this information, write and graph an inequality that describes the ages of all the children that can play in that area.

$0 < x < 5$

Example 2. Write Inequalities from Graphs (Assignment #6-9)
Write the inequality that is represented by each of the following graphs.

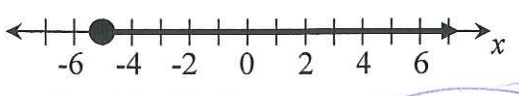
(a)



$x < 3$

- OPEN CIRCLE MEANS $<$ OR $>$
- LEFT MEANS $<$ OR $\leq$

(b)



$x \geq -5$

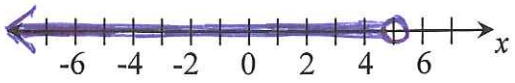
- CLOSED CIRCLE MEANS $\leq$ OR $\geq$
- RIGHT MEANS $>$ OR $\geq$

Example 3. Solve an Inequality Using Addition (Assignment #10-21)

(a) Solve $x-3<2$

$+3 \quad +3$

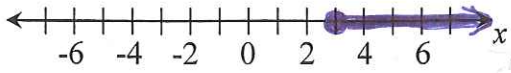
$x<5$



(b) Solve $x-7\geq -4$

$+7 \quad +7$

$x\geq 3$

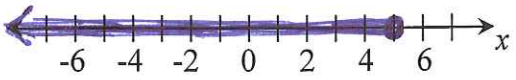


Example 4. Solve an Inequality Using Subtraction (Assignment #10-21)

(a) Solve $x+4\leq 9$

$-4 \quad -4$

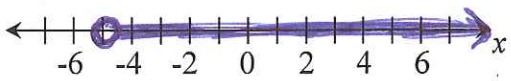
$x\leq 5$



(b) Solve $x+8>3$

$-8 \quad -8$

$x>-5$



Example 5. Translating Verbal Sentences (Assignment #24-26)

Write each of the following sentences as an inequality. Then solve your inequality.

(a) The difference of x and 9 is greater than or equal to -1.

$x-9\geq -1$

$+9 \quad +9$

$x\geq 8$

(b) The sum of 5 and b is less than 12.

$5+b<12$

$-5 \quad -5$

$b<7$

Assignment: Page 359 (3 - 26)

Review:

Solve.

1. $6x+8=32$

2. $-x-5+3x=1$

3. $4(x-9)=8$

4. $\frac{x}{4}=-\frac{x}{2}-1$