

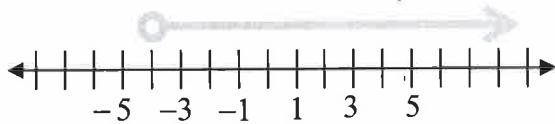
**3-1 Inequalities and Their Graphs****Write the inequality represented by each graph**

1.



$$x \leq 2$$

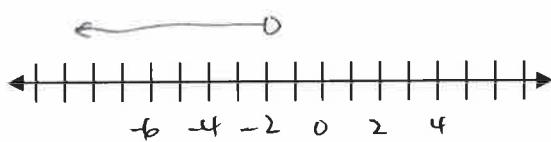
2.



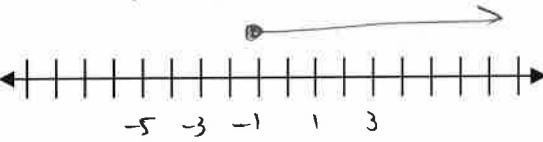
$$x > -4$$

**Graph each inequality.**

3.  $-2 > f \Leftrightarrow f < -2$



4.  $n \geq -1$



5. Define a variable and write an inequality to model this situation: A person must be at most 35 years old to participate in a certain medical study.

Let  $a$  = age of person in years

$$a \leq 35$$

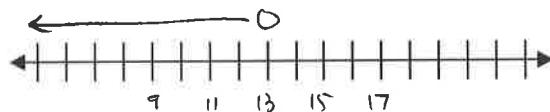
**3-2 Solve Inequalities Using + or -****Solve each inequality and graph the solutions.**

1.

$$v - 5 < 8$$

$$\underline{+5 \quad +5}$$

$$v < 13$$

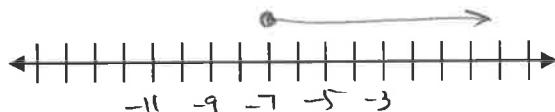


2.

$$d + 4 \geq -3$$

$$\underline{-4 \quad -4}$$

$$d \geq -7$$

**Graph each inequality.**

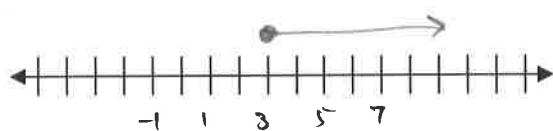
3.

$$0 \leq 2a - a - 3$$

$$0 \leq a - 3$$

$$\underline{+3 \quad +3}$$

$$3 \leq a \text{ so } a \geq 3$$

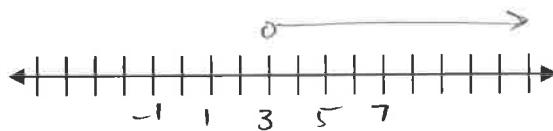


4.

$$t - 8 > -5$$

$$\underline{+8 \quad +8}$$

$$t > 3$$



5. Describe and correct the error:

$-4 + 2$  is not  $-6$ , it is  $-2$

$$y - 2 > -4$$

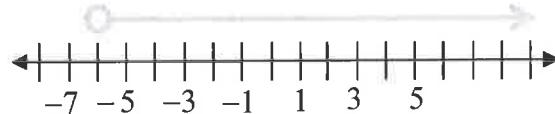
$$\underline{+2 \quad +2}$$

$$y > -2$$

$$y - 2 > -4$$

$$\underline{+2 \quad +2}$$

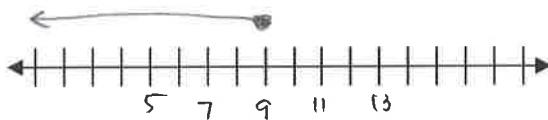
$$y > -6$$



3-3 Solve Inequalities Using  $\times$  or  $\div$ 

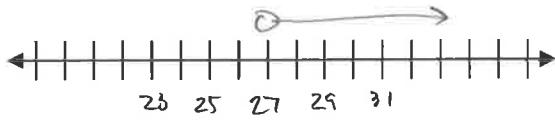
Solve each inequality and graph the solutions.

1.  $\frac{3}{5}t \leq 15 \cdot \frac{3}{5}$   
 $t \leq 9$



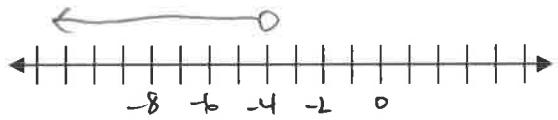
$$\frac{15}{1} \cdot \frac{3}{5} = \frac{9}{1}$$

2.  $\frac{g}{3} - 2 > 7$   
 $+2 +2$   
 $\frac{g}{3} > 9$   
 $\cdot 3 \cdot 3$   
 $g > 27$

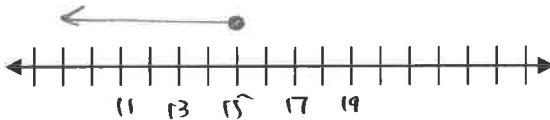


Graph each inequality.

3.  $6 < -3(x + 2)$   
 $6 < -3x - 6$   
 $12 < -3x$   
 $-4 > x$  so  $x < -4$



4.  $-5 \leq \frac{x}{-3}$   
 $15 \geq x$  so  $x \leq 15$



Identify a variable, write an inequality to represent this situation, and solve it.

5. To remain on the football team, Steven must attend at least
- $\frac{3}{4}$
- of the study hall sessions offered. He attends 12 sessions. If Steven barely met the requirements, what is the maximum number of study hall sessions there could have been? (Let
- $x = \#$
- study hall sessions)

$12 \geq \frac{3}{4}x$

$\frac{4}{3}(12) \geq x$

$16 \geq x$

$\text{so } x \leq 16$

There could have been at most 16 study hall sessions.

## 3-4 Solve Multi-Step Inequalities

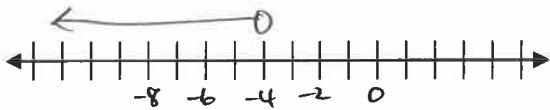
Solve each inequality and graph the solutions.

1. 
$$3f - 12 < -24$$

$$\begin{array}{r} +12 \\ +12 \end{array}$$

$$3f < -12$$

$$f < -4$$

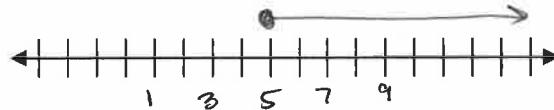


2. 
$$\frac{4}{5}x - 8 \geq -4$$

$$\begin{array}{r} +8 \\ +8 \end{array}$$

$$\frac{4}{5}(\frac{4}{5})x \geq 4(\frac{4}{5})$$

$$x \geq 5$$



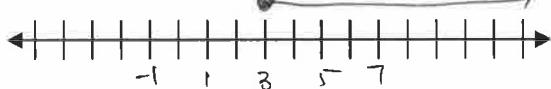
3. 
$$2(3 - 4z) \leq -6z$$

$$\begin{array}{r} 6 - 8z \leq -6z \\ +8z \quad +8z \end{array}$$

$$\frac{6}{2} \leq \frac{2z}{2}$$

$$3 \leq z$$

$$z \geq 3$$

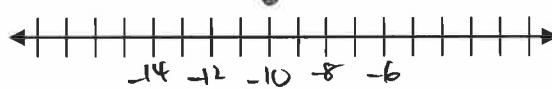


4. 
$$4(k - 6) + 7 \geq 8(k + 3)$$

$$\begin{array}{r} 4k - 24 + 7 \geq 8k + 24 \\ 4k - 16 \geq 8k + 24 \end{array}$$

$$\begin{array}{r} -40 \geq 4k \\ -10 \geq k \end{array}$$

$$k \leq -10$$



Write an inequality to represent the situation. Then solve it.

5. Brad has a budget of \$100 for going to the gym. The gym he uses charges \$25 for a monthly membership and \$4.50 per visit. How many times can Brad go to the gym and spend no more than \$100?

Let  $x = \#$  times Brad goes to the gym

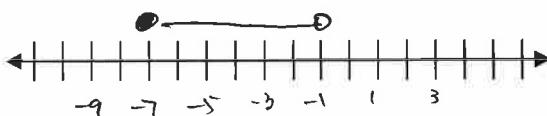
$$\begin{array}{r} 25 + 4.50x \leq 100 \\ -25 \quad -25 \\ 4.50x \leq 75 \\ x \leq 16.\overline{6} \end{array}$$

Brad can go to the gym at most 16 times.

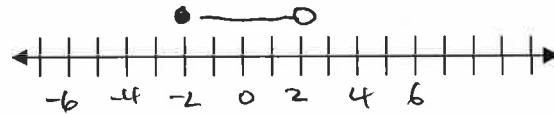
**3-6 Compound Inequalities**

Solve each compound inequality and graph the solutions.

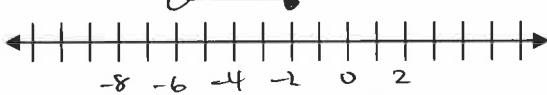
1.  $-4 \leq x + 3 < 2$   
 $\underline{-3 \leq x < -1}$   
 $\boxed{-3 \leq x < -1}$



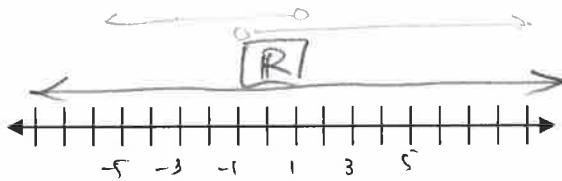
2.  $-1 \leq \frac{g-2}{4} < 0$   
 $-4 \leq g-2 < 0$   
 $\rightarrow \leq g < 2$



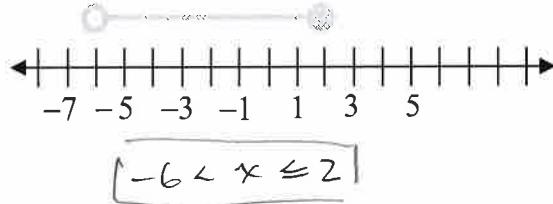
3.  $3 - p \geq 5$  and  $p - 4 > -10$   
 $-p \geq 2$        $p > -6$   
 $p \leq -2$  and  $p > -6$   
 $\boxed{-6 < p \leq -2}$



4.  $r - 3 < -2$  or  $r - 4 > -5$   
 $r < 1$  or  $r > -1$



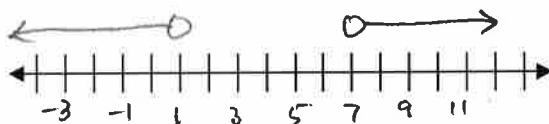
5. Write a compound inequality that could represent the graph.



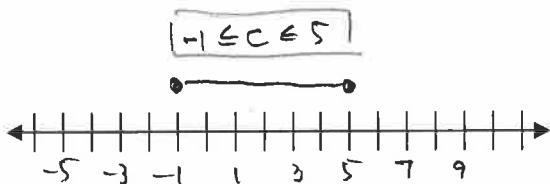
## 3-7 Absolute Value Equations &amp; Inequalities

Solve each and graph the solutions.

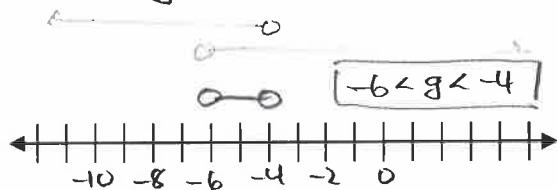
1.  $|k - 4| > 3$   
 $k - 4 > 3 \text{ or } k - 4 < -3$   
 $k > 7 \text{ or } k < 1$



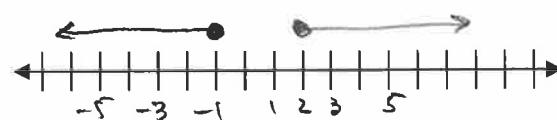
3.  $|6 - 3c| \leq 9$   
 $6 - 3c \leq 9 \text{ and } 6 - 3c \geq -9$   
 $-3c \leq 3 \quad -3c \geq -15$   
 $c \geq -1 \text{ and } c \leq 5$



2.  $|5 + g| < 1$   
 $5 + g < 1 \text{ and } 5 + g > -1$   
 $g < -4 \text{ and } g > -6$



4.  $|4n - 2| \geq 6$   
 $4n - 2 \geq 6 \text{ or } 4n - 2 \leq -6$   
 $4n \geq 8 \quad 4n \leq -4$   
 $n \geq 2 \text{ or } n \leq -1$



5.  $2 + 3|x + 4| = 8$   
 $3|x + 4| = 6$   
 $|x + 4| = 2$

$x + 4 = 2 \text{ or } x + 4 = -2$   
 $x = -2 \text{ or } x = -6$

