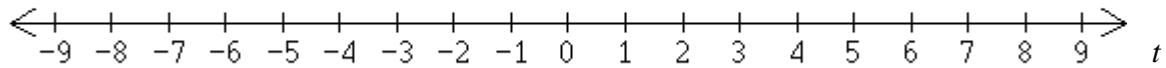
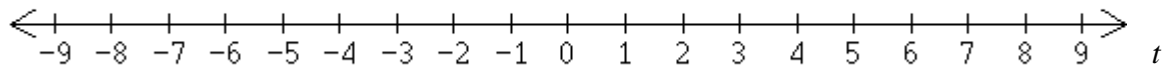
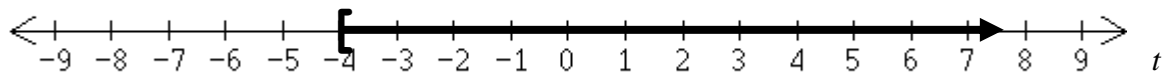


Example 1

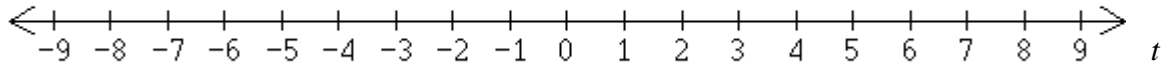
Provide the missing information for each inequality.

inequality: $t > 3$ set builder notationinterval notationinterval typeinequality: $t \leq 3$ set builder notationinterval notationinterval type

inequality:

set builder notationinterval notationinterval type

inequality: $-6 \leq t \leq 1$

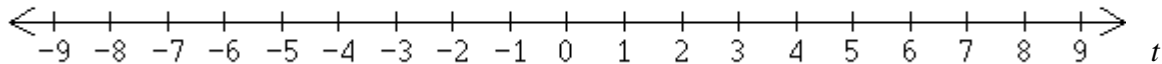


set builder notation

interval notation

interval type

inequality:



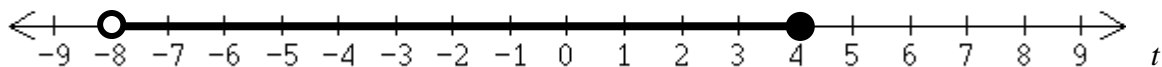
set builder notation

interval notation

interval type

$(-2, 5)$

inequality:



set builder notation

interval notation

interval type

The addition property of inequalities

If $a < b$, then $a + c < b + c$

If $a \leq b$, then $a + c \leq b + c$

If $a > b$, then $a + c > b + c$

If $a \geq b$, then $a + c \geq b + c$

Example 2

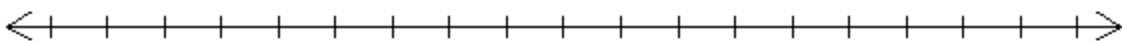
Find the solution set to the inequality $x - 7 \geq 9$. State the solution set using interval notation

Example 3

Find the solution set to inequality $x + 7 \geq 94$. State the solution set using set builder notation.

Example 4

Find the solution set to inequality $-25 \leq w - 15 < 90$. Graph the solution set.



Example 5

Insert the proper inequality symbol (less than or greater than) between each pair of numbers.

Before sense: $\underline{\quad < \quad}$

After sense: $\underline{\hspace{1cm}}$

$$\begin{array}{c} 3 < 5 \\ 2(3) \quad 2(5) \end{array}$$

$$6 \quad 10$$

Before sense: $\underline{\quad > \quad}$

After sense: $\underline{\hspace{1cm}}$

$$\begin{array}{c} -6 > -12 \\ \frac{-6}{3} \quad \frac{-12}{3} \end{array}$$

$$-2 \quad -4$$

Before sense: $\underline{\quad < \quad}$

After sense: $\underline{\hspace{1cm}}$

$$\begin{array}{c} 0 < 2 \\ -5(0) \quad -5(2) \end{array}$$

$$0 \quad -10$$

Before sense: $\underline{\quad > \quad}$

After sense: $\underline{\hspace{1cm}}$

$$\begin{array}{c} 8 > -4 \\ \frac{8}{-4} \quad \frac{-4}{-4} \end{array}$$

$$-2 \quad 1$$

Observation

A strategy for solving linear inequities of form $ax + b < cx + d$

(Note that the strategy directly adapts to the other three inequality signs.)

1. Use the addition property of inequalities to isolate the variable term *on the left side* of the inequality sign and the constant term *on the right side* of the inequality sign.
2. Apply the multiplication property of inequalities to completely isolate the variable *on the left side* of the inequality sign. **Always** explicitly show this step!

Remember – When you **multiply** both sides of the inequality **by a positive number** the inequality sign maintains its **original direction** (sense).

Remember – When you **multiply** both sides of the inequality **by a negative number** the inequality sign **reverses direction** (sense).

3. Make sure that you state your solution set in the requested format(s).

Example 6

Find the solution set to the inequality $4x - 7 \geq 2x + 9$. State the solution set using interval notation.

Example 7

Find the solution set to the inequality $3t + 15 > 9(t + 1)$. State the solution set using interval notation.

Example 8

Find the solution set to the inequality $4 - (3x - 2) \geq 2 + 2(2 - x)$. State the solution set using set builder notation.

Example 9

J. Z.'s HPE teacher likes to keep grading simple. The teacher assigns grades based upon attendance (out of 100 points), a midterm and final exam - the two tests are each also worth 100 points. J.Z. was a bad boy and only earned 65 of his attendance points. The lack of attendance was reflected in J.Z.'s midterm score, which was 62. J.Z. needs 210 points total to scrape a C out of the class. What is the minimum score J.Z. can earn on his final to scrape his C? Use a proper inequality to determine your solution.