- is greater than
- is more than

- is less than
- is fewer than

- is greater than or equal to
- is at least
- is no less than

- is less than or equal to
- is at most
- is no more than

Set Notation
{ , }

Solve and graph the solution.

The sum of x and 3 is less than 8.

$x + 3 < 8$
$-3 \quad -3$
$x < 5$

{x | x < 5}

Set-builder notation: x "such that" ....

8 less than x

x − 8

8 is less than x

8 < x

Solve and graph the solution.

The difference of b and one-half is at most three-fourths.

$b - \frac{1}{2} \leq \frac{3}{4}$

$b - \frac{2}{4} \leq \frac{3}{4}$

$+\frac{2}{4} \quad +\frac{2}{4}$

$b \leq \frac{5}{4}$

{ b | b ≤ 5/4 }

Set-builder notation:

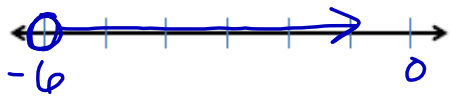
$4b - 2 \leq 3$
$+2 \quad +2$
$4b \leq 5$
$b \leq \frac{5}{4}$

Solve and graph the solution.

$m - 5 > -11$
$+5 \quad +5$
$m > -6$

5 subtracted from m is more than -11.

Set-builder notation: $\{m \mid m > -6\}$

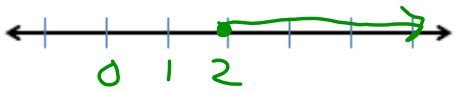


Solve and graph the solution.

$10 + n \geq 12$
$-10 \quad -10$
$n \geq 2$

10 added by n is greater than or equal to 12.

Set-builder notation: $\{n \mid n \geq 2\}$



MULTIPLYING

When multiplying both sides of an inequality by a NEGATIVE NUMBER, the inequality symbol is reversed.

A number divided by -3 is less than 5.

$\frac{n}{-3} < 5$
$\frac{-3}{1} \cdot \frac{n}{-3} < 5 \cdot -3$
$n > -15$

One-half of a number is more than -8.

$2 \cdot \frac{1}{2}n > -8 \cdot 2$
$n > -16$

$-\frac{2}{3}$ of a number is less than -4

$-\frac{2}{3}n < -4$
$-\frac{3}{2} \cdot -\frac{2}{3}n > -4 \cdot -\frac{3}{2}$
$n > 6$

DIVIDING

When dividing both sides of an inequality by a NEGATIVE NUMBER, the inequality symbol is reversed.

Four times a number is at least 10.

$\frac{4x}{4} \geq \frac{10}{4}$
$x \geq \frac{5}{2}$

Negative five times a number is no more than -10.

$\frac{-5n}{-5} \leq \frac{-10}{-5}$
$n \geq 2$
$\{n \mid n \geq 2\}$

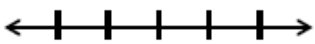
* One eighth of a number is less than or equal to 3.

$\frac{1}{8}x \leq 3$

$8 \cdot \frac{1}{8}x \leq 3 \cdot 8$

$x \leq 24$

A number divided by 4 is less than -2.



* Negative one-sixth of a number is less than -9.

$-\frac{1}{6}x < -9$

$-6 \cdot -\frac{1}{6}x > -9 \cdot -6$

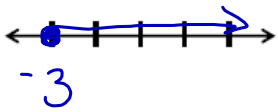
$x > 54$

Three times a number is at least negative nine.

$3x \geq -9$

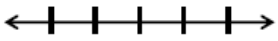
$x \geq -3$

$\{x | x \geq -3\}$



Negative twelve times a number is less than 84.

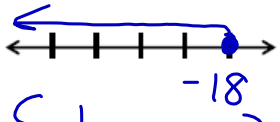
$-12x < 84$



Negative two-thirds times a number is at least 12.

$-\frac{3}{2} \cdot -\frac{2}{3}x \geq 12 \cdot -\frac{3}{2}$

$x \leq -18$



$\{x | x \leq -18\}$