8.1 (Page 284) Equations & the Number Line

The purpose of graphs is to display data in a concise way. In algebra, we will display data about equations and inequalities.

Recall that the coordinate of a point tells its distance and direction from the 0-point of the number line. The dot marking the point is called the graph of the number.

In this lesson, we will be graphing the solution of an equation on a number line.

8.1 (Page 284) Equations & the Number Line

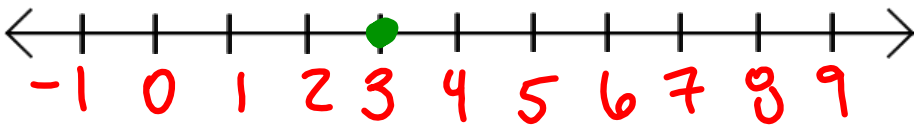
Example: Solve each equation & graph the solution.

$$2x - 1 = 5$$

$$+1 \quad +1$$

$$\frac{2x}{2} = \frac{6}{2}$$

$$\boxed{x = 3}$$



8.1 (Page 284) Equations & the Number Line

Example: Solve each equation & graph the solution.

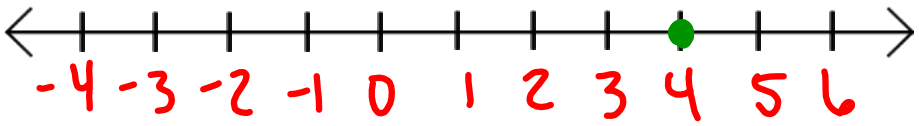
$2a + a + 5 + 1 = 18$

$3a + 6 = 18$

$-6 \quad -6$

$\frac{3a}{3} = \frac{12}{3}$

$a = 4$



8.1 (Page 284) Equations & the Number Line

Example: Solve each equation & graph the solution.

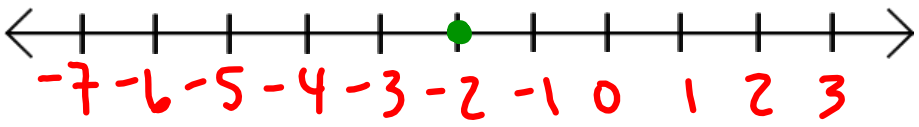
$1 + 10x = 8x - 3$

$-8x \quad -8x$

$1 + 2x = -3$

$-1 \quad -1$

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



8.2 (Page 286) Inequalities & the Number Line

Just as you can solve and graph equations, you can solve and graph inequalities.

Now, instead of just a point on the number line, there is the possibility of an open or closed circle at the solution. In addition, with inequalities, we have to shade the solution set on the number line.

8.2 (Page 286) Inequalities & the Number Line

Open Circle at the Solution

$<, >$

Closed Circle at the Solution

$\leq, \geq$

Shade to the Left

$<, \leq$

Shade to the Right

$>, \geq$

8.2 (Page 286) Inequalities & the Number Line

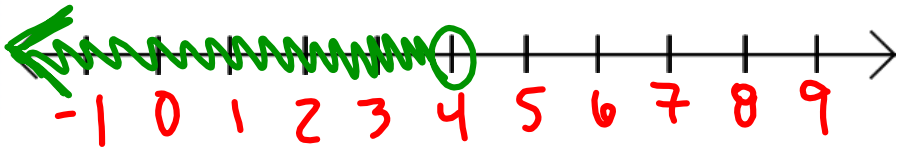
Example: Solve each inequality and graph the solution.

$x - 1.3 < 2.7$

$+1.3 \quad +1.3$

$x < 4$

open circle
Shade left



8.2 (Page 286) Inequalities & the Number Line

Example: Solve each inequality and graph the solution.

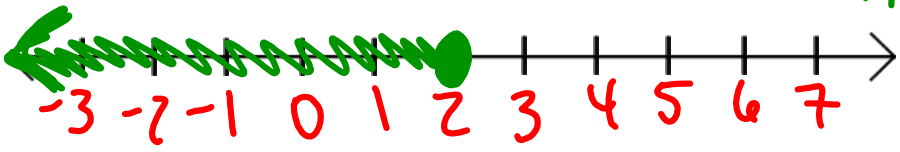
$2x - 1 \leq 3$

$+1 \quad +1$

$\frac{2x}{2} \leq \frac{4}{2}$

$x \leq 2$

closed circle
Shade left



8.2 (Page 286) Inequalities & the Number Line

Example: Solve each inequality and graph the solution.

$9r + 3 < 6r + 6$

$-6r \quad -6r$

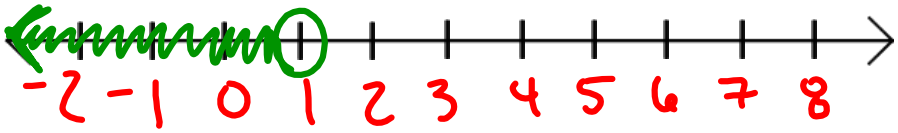
$3r + 3 < 6$

$-3 \quad -3$

$\frac{3r}{3} < \frac{3}{3}$

open circle shade left

$r < 1$



8.2 (Page 286) Inequalities & the Number Line

Example: Solve each inequality and graph the solution.

$3(x + 6) > 2x + 12$

$3x + 18 > 2x + 12$

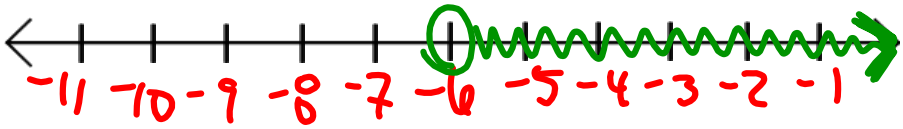
$-2x \quad -2x$

$x + 18 > 12$

$-18 \quad -18$

$x > -6$

open circle Shade right



8.2 (Page 286) Inequalities & the Number Line

Example: Solve each inequality and graph the solution.

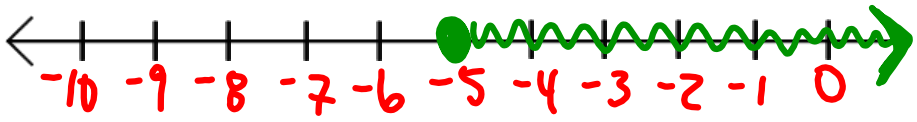
$3y - 8 \geq -23$

$+8 \quad +8$

$\frac{3y}{3} \geq \frac{-15}{3}$

$y \geq -5$

Closed circle
Shade right



8.2 (Page 286) Inequalities & the Number Line

Example: Solve each inequality and graph the solution.

$4(x - 8) > 3x - 29$

$4x - 32 > 3x - 29$

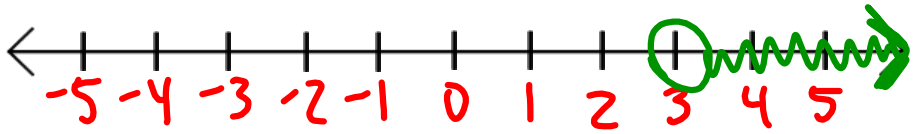
$-3x \quad -3x$

$x - 32 > -29$

$+32 \quad +32$

$x > 3$

Open circle
Shade right



8.2 Inequalities and the Number Line.notebook