

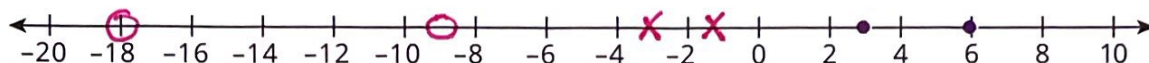
**ACTIVITY 3****MATHia CONNECTION**

- Solving One-Step Linear Inequalities

Multiplying and Dividing by Negative Numbers

Finally, let's investigate what happens when you multiply or divide each side of an inequality by the same negative number.

➤ Consider the inequality $3 < 6$.



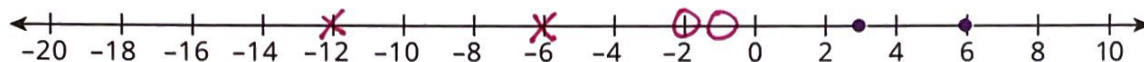
- 1 Multiply the values 3 and 6 by $-\frac{1}{2}$ and plot the new values on the number line using an X. Complete the statement using an inequality symbol.

$$3\left(-\frac{1}{2}\right) \underline{\hspace{1cm}} 6\left(-\frac{1}{2}\right)$$

- 2 Multiply the values 3 and 6 by -3 and plot the new values on the number line using an O. Complete the statement using an inequality symbol.

$$3(-3) \underline{\hspace{1cm}} 6(-3)$$

➤ Consider again the inequality $3 < 6$.



- 3 Divide the values 3 and 6 by $-\frac{1}{2}$ and plot the new values on the number line using an X. Complete the statement using an inequality symbol.

$$3 \div \left(-\frac{1}{2}\right) \underline{\hspace{1cm}} 6 \div \left(-\frac{1}{2}\right) \quad \text{or} \quad \frac{3}{\left(-\frac{1}{2}\right)} \underline{\hspace{1cm}} \frac{6}{\left(-\frac{1}{2}\right)}$$

- 4 Divide the values 3 and 6 by -3 and plot the new values on the number line using an O. Complete the statement using an inequality symbol.

$$3 \div (-3) \underline{\hspace{1cm}} 6 \div (-3) \quad \text{or} \quad \frac{3}{(-3)} \underline{\hspace{1cm}} \frac{6}{(-3)}$$

- 5 When you multiply the same negative number to each side of the inequality or divide the same negative number from each side of the inequality, what do you notice about the resulting inequality symbol?

The inequality symbol switches

HABITS OF MIND

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.

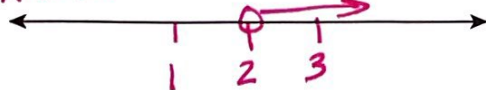


- 10 Solve each inequality and graph the solution set. Then, list three values from each solution set, and verify that each value makes the original inequality true.

a $8x > 16$

$$\frac{8x}{8} > \frac{16}{8}$$

$$x > 2$$



$$8 \cdot 3 > 16$$
$$24 > 16$$

$$8 \cdot 4 > 16$$
$$32 > 16$$

$$8 \cdot 5 > 16$$
$$40 > 16$$

b $\frac{x}{3} \leq -4 \cdot 3$

$$x \leq -12$$



$$\frac{-15}{3} \leq -4$$

$$-5 \leq -4$$

$$\frac{-18}{3} \leq -4$$

$$-6 \leq -4$$

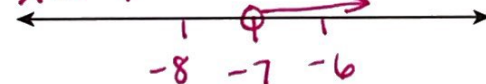
$$\frac{-21}{3} \leq -4$$

$$-7 \leq -4$$

c $-5x < 35$

$$\frac{-5x}{-5} < \frac{35}{-5}$$

$$x > -7$$



$$-5(-6) < 35$$
$$30 < 35$$

$$-5(-5) < 35$$
$$25 < 35$$

$$-5(-4) < 35$$
$$20 < 35$$

d $\frac{x}{-2} \geq 5 \cdot -2$

$$x \geq -10$$



$$\frac{-12}{-2} \geq 5$$

$$6 \geq 5$$

$$\frac{-14}{-2} \geq 5$$

$$7 \geq 5$$

$$\frac{-16}{-2} \geq 5$$

$$8 \geq 5$$