Lesson 4 - Solving Inequalities - Two-Step & Multi-Step

You can solve two-step inequalities in the same way you solve two-step equations.

The goal is to isolate the variable.

Solve each inequality.

1) $6m + 7 < -5$ -7 -7

$$\frac{6m}{6} < \frac{-12}{6}$$

$$m < -2$$

2) $-\frac{x}{4} + 8 \geq 11$

$$\frac{x}{-4} + 8 \geq 11 \quad -8 \quad -8$$

$$(-4)\left(\frac{x}{-4}\right) \geq 3(-4)$$

$$x \leq -12$$

Practice

Solve each inequality.

1. $17 \leq 3w - 4$
$+4 \qquad +4$

$$\frac{21}{3} \leq \frac{3w}{3}$$

$$7 \leq w$$

2. $\frac{y}{-2} - 8 < -6$
$+8 \quad +8$

$$-2\left(\frac{y}{-2}\right) < (2)-2$$

$$y > -4$$

3. $-2r - 10 > 6$
$+10 \quad +10$

$$\frac{-2r}{-2} > \frac{16}{-2}$$

$$r < -8$$

Word Problem

You borrow $150 from a friend to help pay for a new skateboard. You pay your friend back $15 per week. Write and solve an inequality to find when you will owe your friend less than $30.
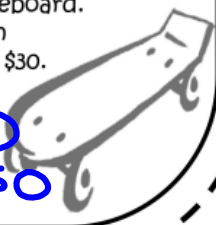
$$150 - 15w < 30$$
$$-150 \qquad\qquad -150$$

$$\frac{-15w}{-15} < \frac{-120}{-15}$$

$$w > 8$$

Multi-Step Inequalities

$$-8(3 + s) \geq 32 \qquad 4 + 5x < 12x - 10$$

$$-24 - 8s \geq 32 \qquad \frac{-12x \quad -12x}{}$$
$$+24 \qquad\qquad +24 \qquad 4 - 7x < -10$$
$$\qquad\qquad\qquad\qquad\qquad -4$$
$$\frac{-8s}{-8} \geq \frac{56}{-8} \qquad \frac{-7x}{-7} < \frac{-14}{-7}$$
$$s \leq -7 \qquad\qquad x > 2$$