Solving Inequalities

- To solve an inequality, use the same procedure as solving an equation with one exception. When multiplying or dividing *by* a *negative number*, reverse the direction of the inequality sign.

- $-3x < 6$ divide both sides by **-3**
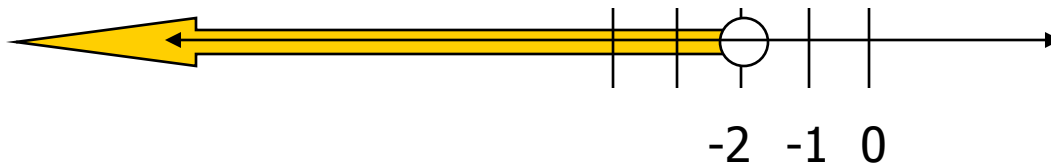
$$-3x/-3 > 6/-3$$

$$x > -2$$

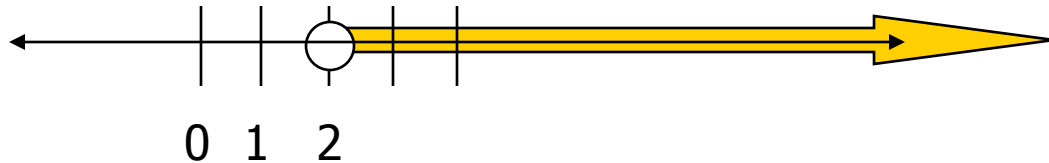# Solving Inequalities

- $-4x + 2 > 10$

    $-4x > 8$

    $x < -2$

- **To graph the solution set, circle the boundary and shade according to the inequality.**

- **Use an open circle for < or > and closed circles for ≤ or ≥.**

Solving Inequalities

- **$3b - 2(b - 5) < 2(b + 4)$**

    $3b - 2b + 10 < 2b + 8$

    $b + 10 < 2b + 8$

    $-b + 10 < 8$

    $-b < -2$

    $b > 2$

Solving Absolute Value Inequalities

- Solving absolute value inequalities is a combination of solving absolute value equations and inequalities.

- Rewrite the absolute value inequality.

  - For the first equation, all you have to do is drop the absolute value bars.

  - For the second equation, you have to *negate* the right side of the inequality and *reverse* the inequality sign.

Solve: $|2x + 4| > 12$

$2x + 4 > 12$ **or** $2x + 4 < -12$

$2x > 8$ $2x < -16$

$x > 4$ **or** $x < -8$

$x < -8$ **or** $x > 4$
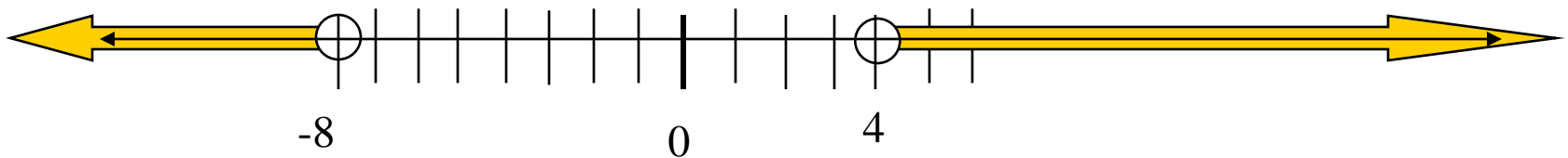
Solve: $2|4 - x| < 10$

$$|4 - x| < 5$$

$$4 - x < 5 \quad \text{and} \quad 4 - x > -5$$

$$- x < 1 \qquad\qquad - x > -9$$

$$x > -1 \quad \text{and} \quad x < 9$$

$$-1 < x < 9$$