

6.3 Solve Multi-Step Inequalities

TEKS

A.7.A, A.7.B,
A.7.C

Before

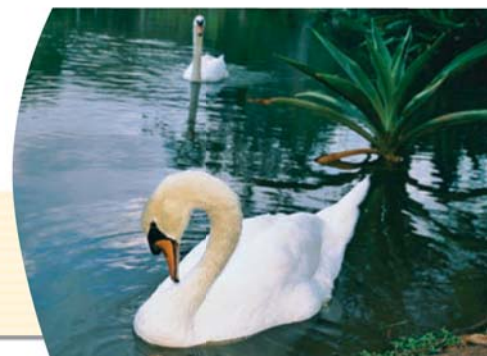
You solved one-step inequalities.

Now

You will solve multi-step inequalities.

Why?

So you can compare animal habitats, as in Ex. 39.



Key Vocabulary

- **inequality**, p. 21

The steps for solving two-step and multi-step equations can be applied to linear inequalities. For inequalities, be sure to reverse the inequality symbol when multiplying or dividing by a negative number.

EXAMPLE 1 Solve a two-step inequality

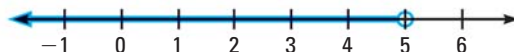
Solve $3x - 7 < 8$. Graph your solution.

$$3x - 7 < 8 \quad \text{Write original inequality.}$$

$$3x < 15 \quad \text{Add 7 to each side.}$$

$$x < 5 \quad \text{Divide each side by 3.}$$

- The solutions are all real numbers less than 5. Check by substituting a number less than 5 in the original inequality.



CHECK $3x - 7 < 8$ Write original inequality.

$$3(0) - 7 \stackrel{?}{<} 8 \quad \text{Substitute 0 for } x.$$

$$-7 < 8 \quad \checkmark \quad \text{Solution checks.}$$

EXAMPLE 2 Solve a multi-step inequality

Solve $-0.6(x - 5) \leq 15$.

$$-0.6(x - 5) \leq 15 \quad \text{Write original inequality.}$$

$$-0.6x + 3 \leq 15 \quad \text{Distributive property}$$

$$-0.6x \leq 12 \quad \text{Subtract 3 from each side.}$$

$$x \geq -20 \quad \text{Divide each side by } -0.6. \text{ Reverse inequality symbol.}$$



GUIDED PRACTICE for Examples 1 and 2

Solve the inequality. Graph your solution.

1. $2x - 5 \leq 23$

2. $-6y + 5 \leq -16$

3. $-\frac{1}{4}(p - 12) > -2$