Solving Inequalities

An *inequality* is like an equation, but instead of an equal sign (=) it has one of these signs:

- < : less than
- \leq : less than or equal to
- > : greater than
- \geq : greater than or equal to

"x < 5"

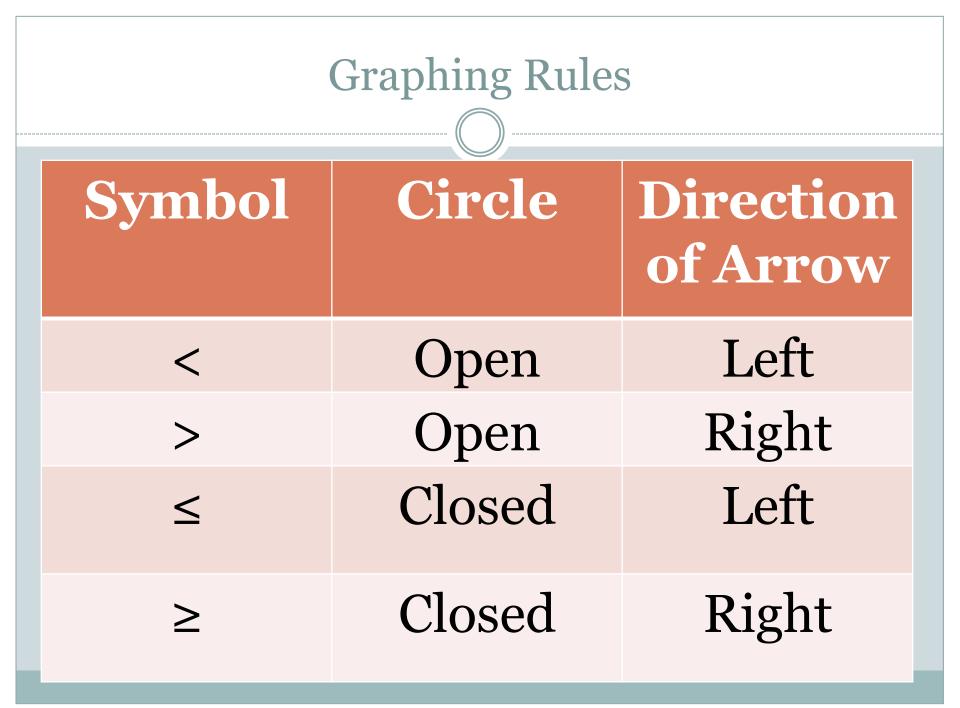
means that whatever value *x* has, it must be less than 5.

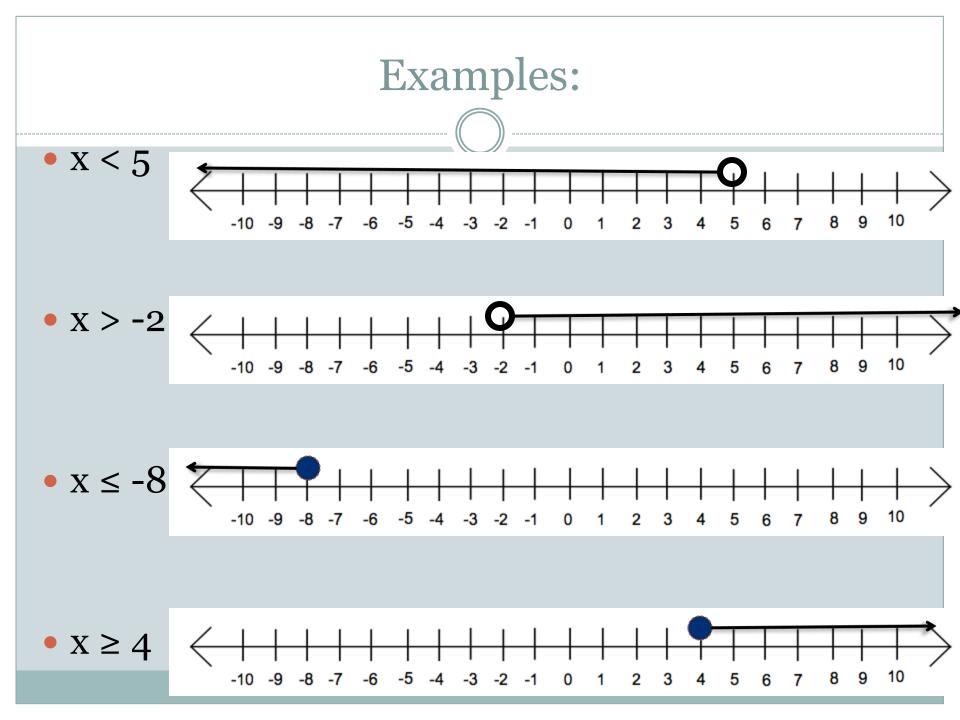
What could x be?

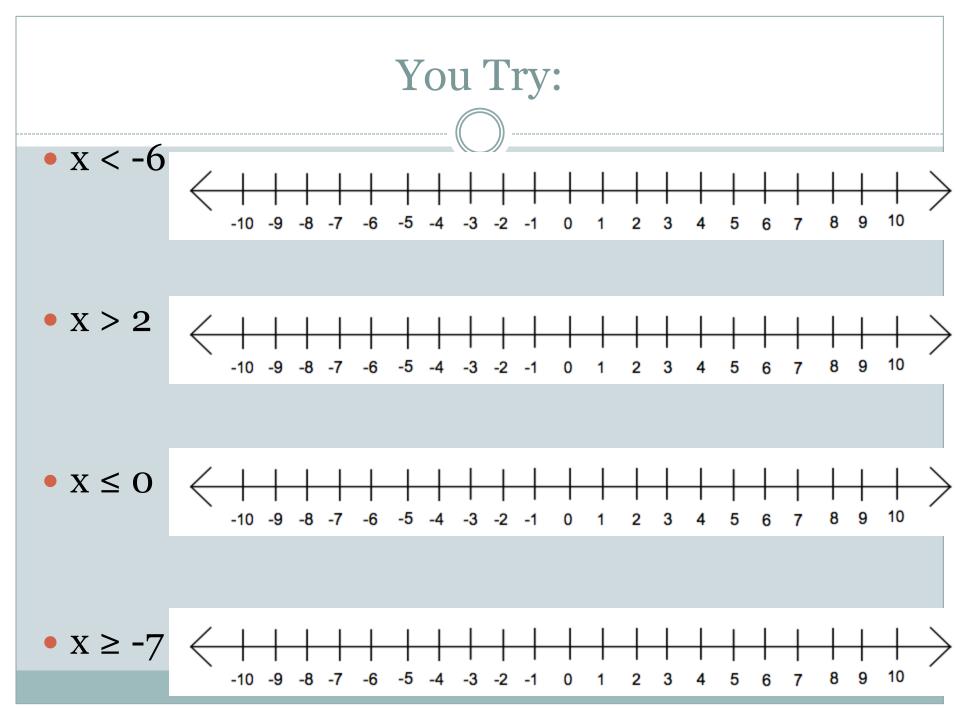
$\mathbf{``X \geq -2''}$

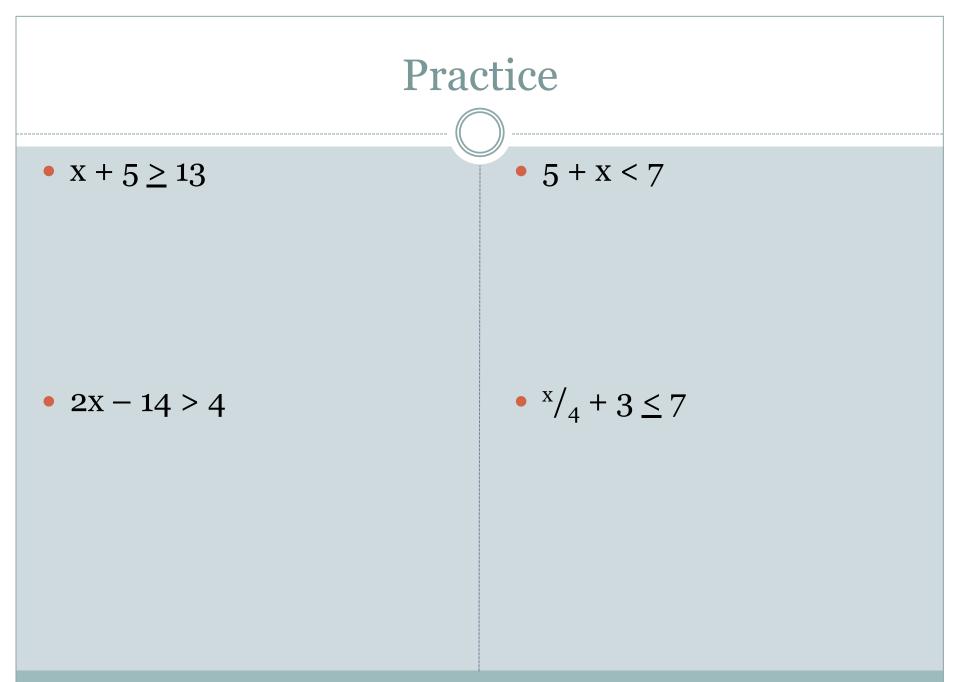
means that whatever value *x* has, it must be greater than <u>or</u> equal to -2.

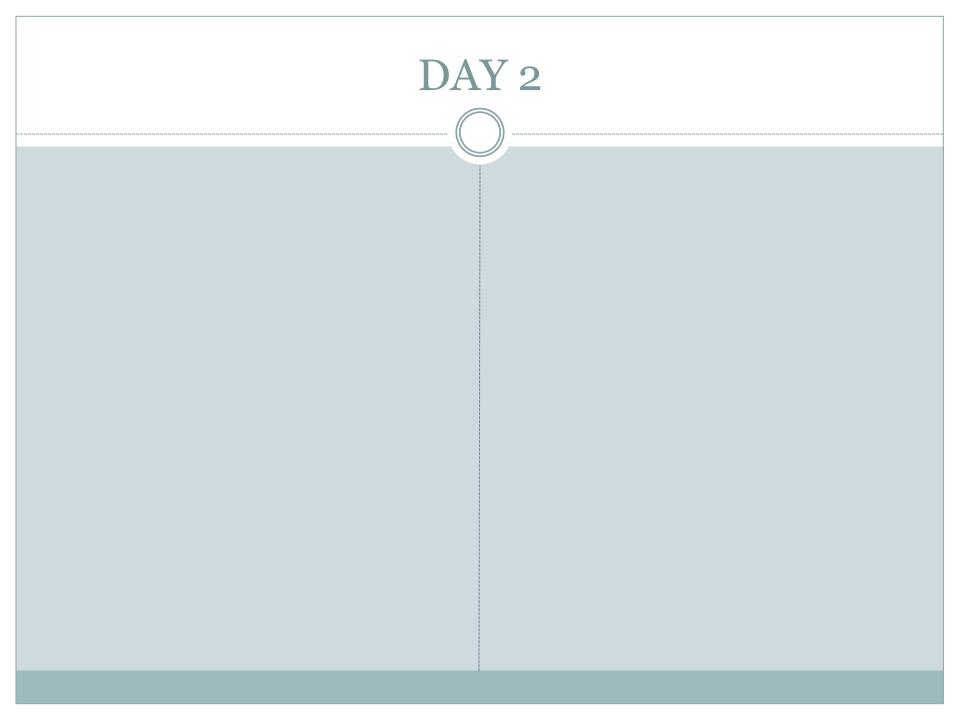
What could x be?









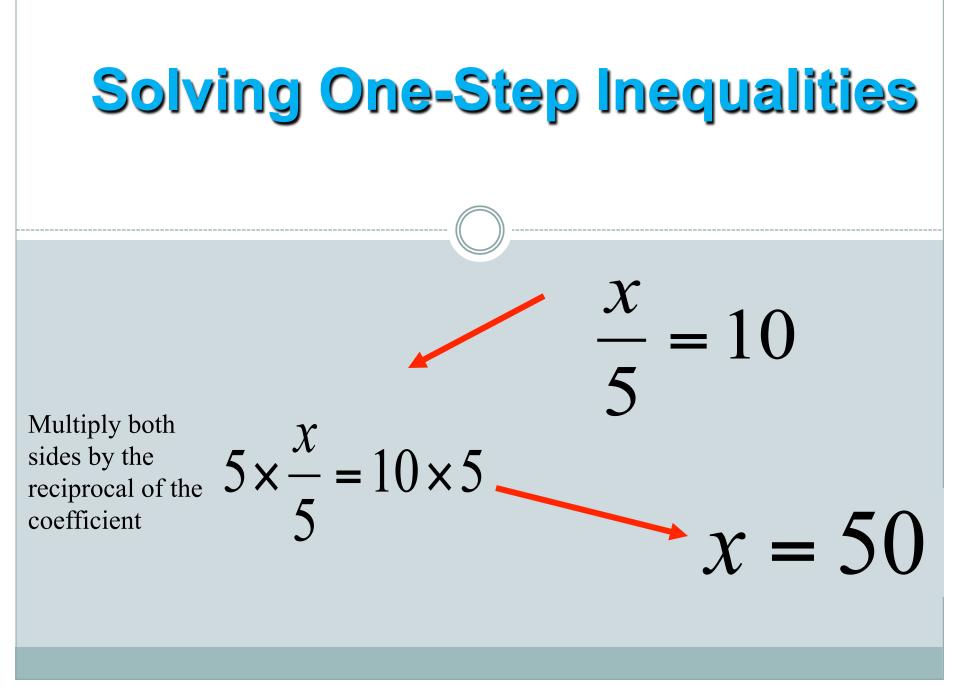


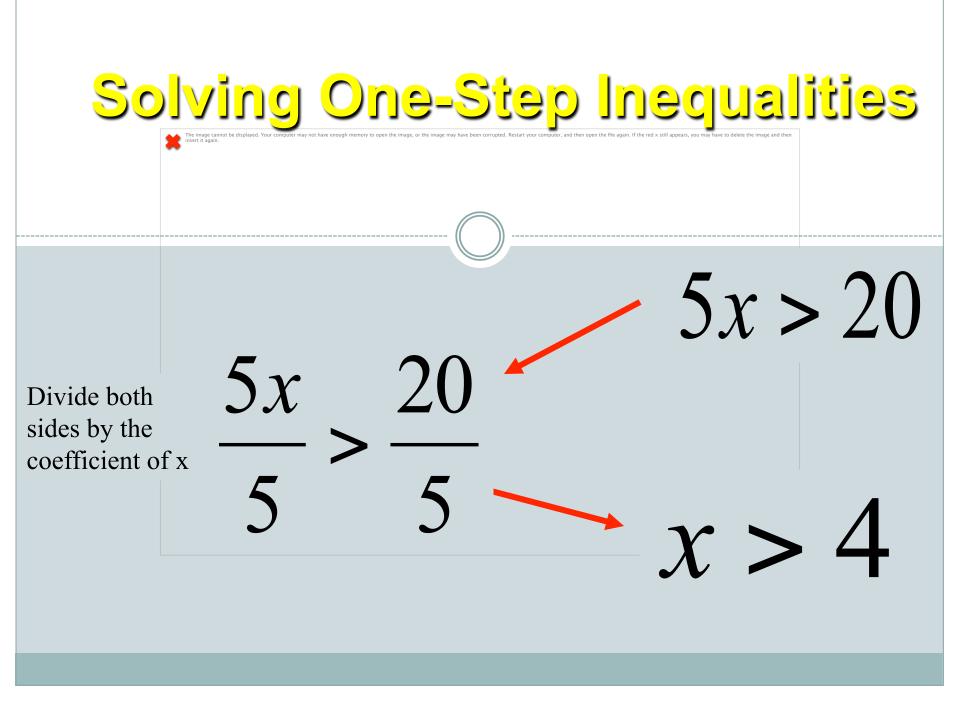
Use the Key Words to Write an Inequality

- A number added to 5 is greater than 12
- The quotient of 2 and a number is at most 6
- 7 multiplied by a number is less than 16
- 18 decreased by a number is no less than 12.8
- 17 is greater than or equal to 8 less than a number

X-15<73

y+15<25



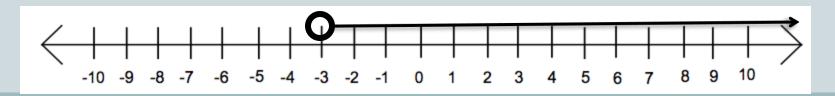


Solving Inequalities!

- Solving inequalities is the same as solving equations.
- There are only 2 things you need to know...
 - 1.) If you multiply or divide by a negative number you must switch the sign.

$$-7x < 21$$
Dividing by a $-7 - 7$ -7 $x > -3$ Switch the sign!!

• 2.) You will graph your solutions.

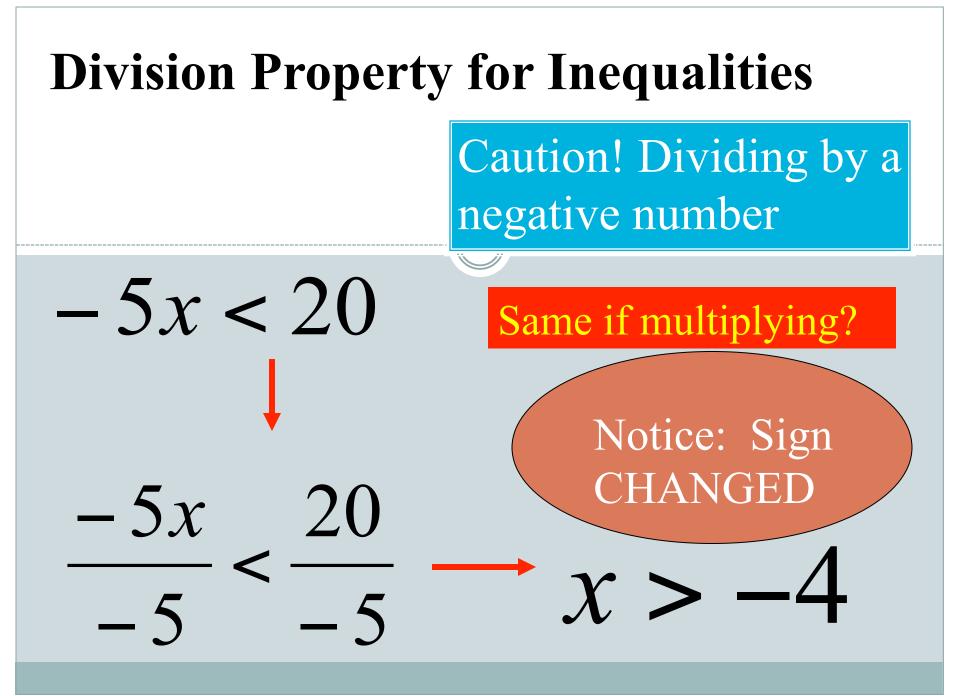


Special Case 1: Switching the Signs

 When solving inequalities, if you multiply or divide by a negative you must switch the signs.

• Switching the signs:

- Less than becomes Greater than < switches to >
- Greater than becomes Less than > switches to <
- Less than or equal to becomes Greater than or equal to
 - \leq switches to \geq
- Greater than or equal to becomes Less than or equal to
 - \geq switches to \leq



Multiplication Property for Inequalities





Caution! When you multiply by a negative number...

> ...the sign CHANGES

> > $\chi < -10$

(-5) - x > 2(-5)

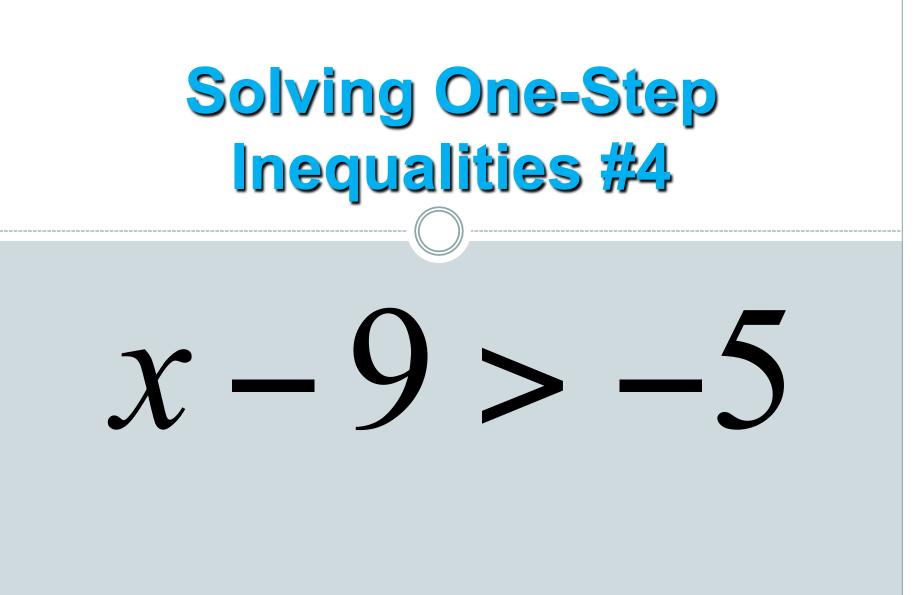


Let's try some on our own ready?

$x + 6 \le 7$

$3 \le x - 5$

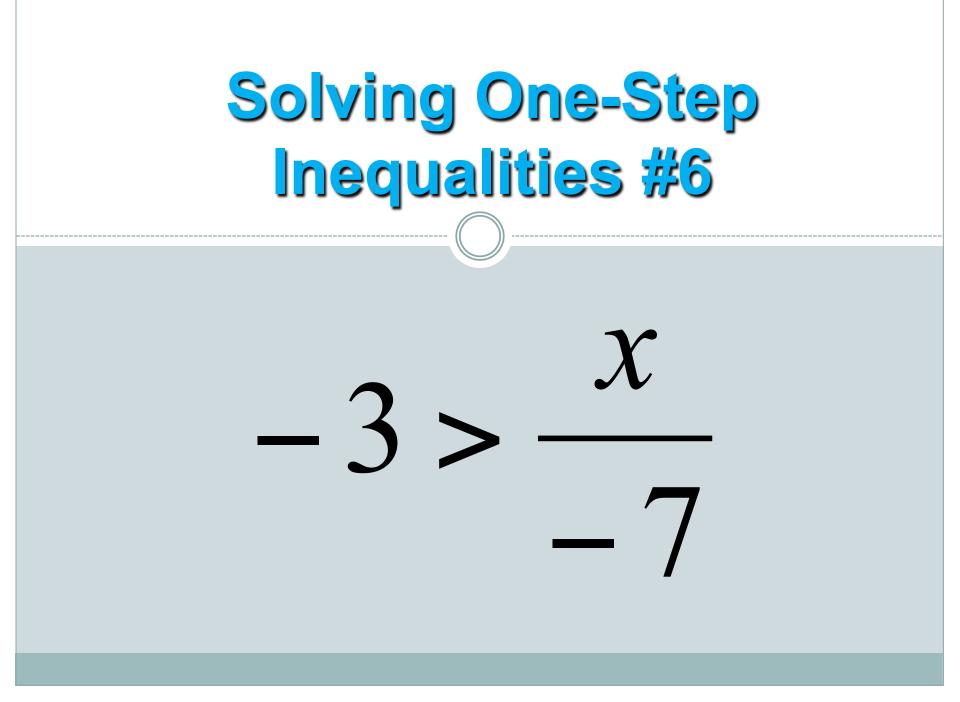
$-3x \ge -15$



Answers for #1 - #4

1. $x \le 1$ 2. $8 \le x \text{ or } x \ge 8$ 3. $x \le 5$ 4. x > 4

 $\frac{1}{2}x \ge -3$



$5 + x \ge 7$

 $\frac{x}{-3} > 5$

Answers for #5 - #8

5. $x \ge -6$ 6. 21 < x or x > 217. $x \ge 2$

8. *x* > 15

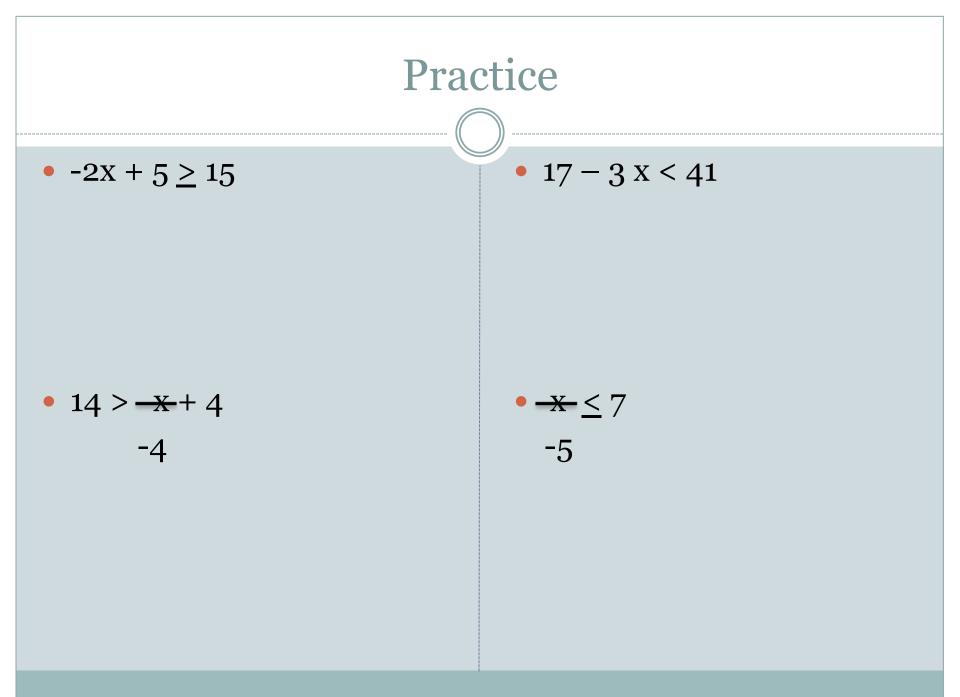
Day 3 Solving Multi-Step Inequalities

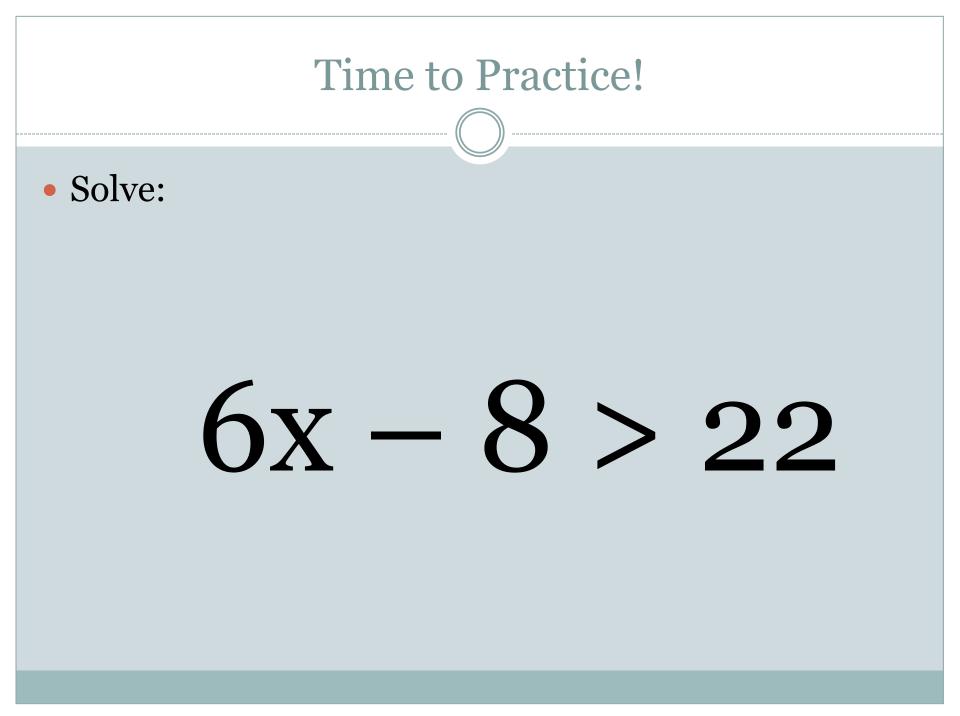
Solving İnequalities

• Follow same steps used to solve equations:

$$3x + 4 < 13$$

 $-4 -4$
 $3x < 9$
 $3 3$
 $x < 3$



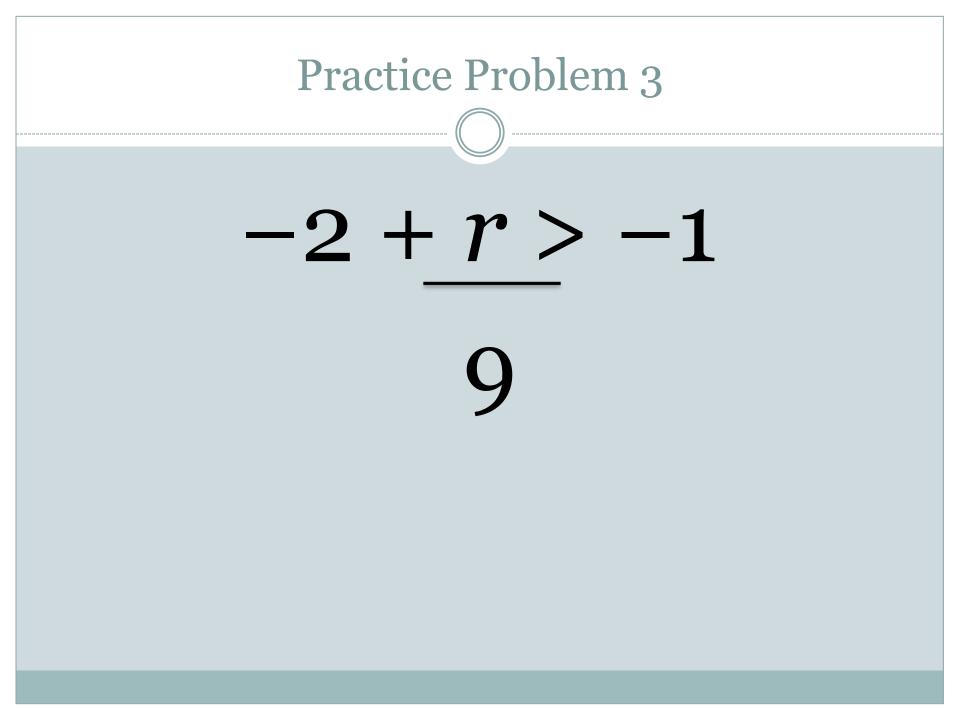


Practice Problem 1

-4 - 5v < -29

Practice Problem 2

$-1 + 4x \leq 31$



Practice Problem 4 -52 < 8 - 5k

Practice Problem 5

8 - 7n > -20

