

Solving Multi-Step Inequalities

BEFORE

You solved one-step inequalities.

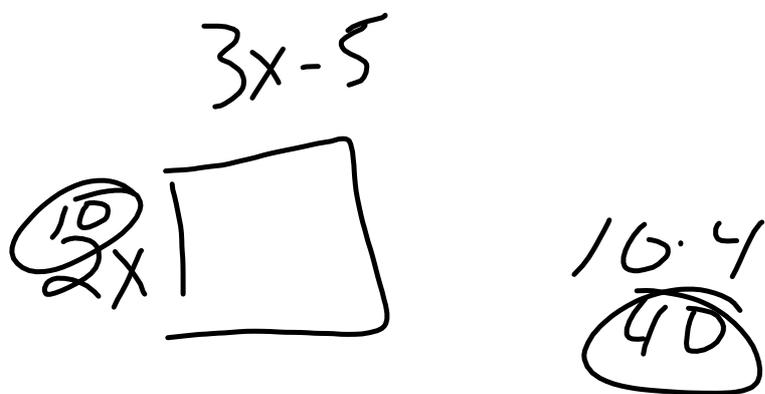
Now

You'll solve multi-step inequalities.

WHY?

So you can find how long to run a commercial, as in Ex. 23.

Review Vocabulary
inequality, p. 140



$$2x + 2x = 3x - 5 + 2x$$

$$\rightarrow 0 = x - 5 + 5$$

$$s = 4$$

LESSON

3.6

Name _____ Date _____

Practice A

For use with pages 151-155

Tell whether the given number is a solution of $\frac{x}{-4} + 5 > 9$.

1. -4

2. -20

3. -16

4. 4

$$\frac{-20}{-4} + 5 > 9$$

$$5 + 5 > 9$$

$$10 > 9$$

YES

Tell whether the given number is a solution of $7x - 6 \leq 4x + 9$.

5. 8

6. 5

7. 0

8. -5

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$$7(8) - 6 \leq 4 \cdot 8 + 9$$

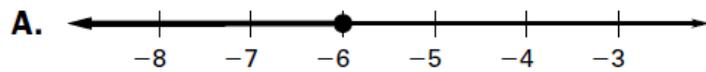
$$56 - 6 \leq 32 + 9$$

$$50 \leq 41$$

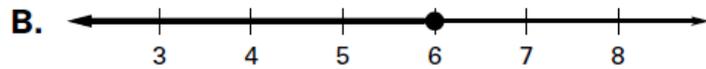
NO

Match the inequality with the graph of its solution.

9. $\frac{x}{3} - 7 \leq -5$



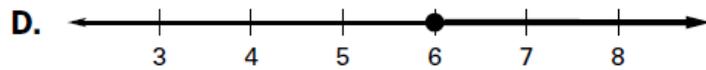
10. $-5x + 6 \leq -24$



11. $\frac{x}{-3} + 9 \leq 11$



12. $-5x - 6 \geq 24$



Solve the inequality. Graph your solution.

13. $3x + 8 < 8$

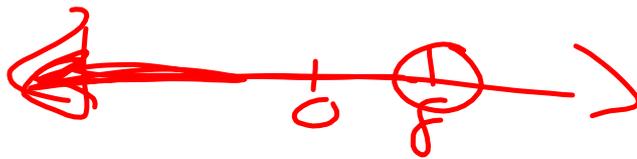
14. $4x - 7 \geq 5$

15. $13 - 2x > -3$

$$-13 + 13 - 2x > -3 + 13$$

$$-2x > -16 \quad | \cdot \frac{1}{-2}$$

$$x < 8$$



16. $-1 + 5x \leq -26$

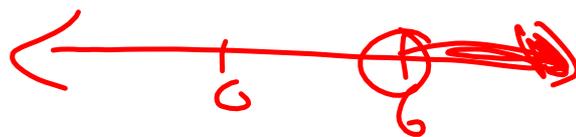
17. $\frac{x}{2} + 5 > 8$

18. $\frac{x}{4} - 6 \leq -10$

$-5 \rightarrow \frac{x}{2} + 5 > 8 \rightarrow -5$

$2 \cdot \frac{x}{2} > 3 \cdot 2$

$x > 6$



19. $-11 + \frac{x}{7} < -14$

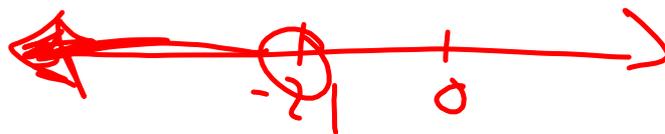
20. $\frac{x}{-3} - 1 \leq 11$

21. $16 \leq \frac{x}{20} - 13$

1) $-11 + \frac{x}{7} < -14 + 11$

7. $\frac{x}{7} < -3$

$x < -21$



22. $5x + 12 > 3x - 8$

23. $10x - 6 \leq -x + 38$

24. $-6x - 1 < -2x + 7$

$$x + 10x - 6 \leq -x + 38 + x$$

$$6 + 11x - 6 \leq 38 + 6$$

$$\frac{1}{11} 11x \leq 44 \cdot \frac{1}{11}$$

$$\leftarrow x \leq 4$$

25. $6x + 7 \leq x + 32$

26. $8 + x > 2x - 9$

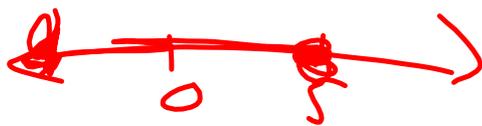
27. $13x - 8 \geq -2x + 97$

$$\begin{aligned} -x + 6x + 7 &\leq x + 32 - 5x \\ 5x + 7 &\leq 32 - 4x \end{aligned}$$

$$\begin{aligned} \rightarrow 5x + 7 &\leq 32 - 4x \\ \rightarrow 5x + 4x &\leq 32 - 7 \end{aligned}$$

$$\frac{1}{5} 5x \leq 25 \frac{1}{5}$$

$$x \leq 5$$



28. Your school's basketball team is trying to break the school record for points scored in a season. Your team has already scored 736 points this season. The record is 1076 points. With 10 games remaining on the schedule, how many points per game does your team need to average to break the record? Use the verbal model below to write and solve an inequality to solve the problem. Let p represent the points scored per game.

Points scored this season	+	Number of games left	•	Points scored per game	>	School record
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$$\begin{aligned}
 & \overset{-736}{+} 736 + 10p > 1076 \quad \overset{-736}{-} 736 \\
 & \frac{1}{10} 10p > 340 \quad \cdot \frac{1}{10} \\
 & p > 34
 \end{aligned}$$