4.4 Greater Than?
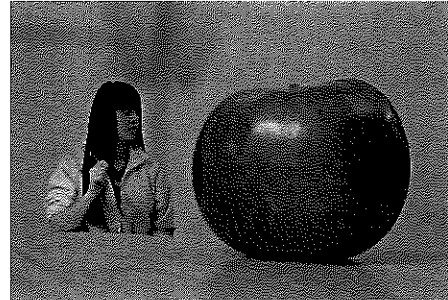
A Develop Understanding Task

For each situation you are given a mathematical statement and two expressions beneath it.

1. Decide which of the two expressions is greater, if the expressions are equal, or if the relationship cannot be determined from the statement.
2. Write an equation or inequality that shows your answer.
3. Explain why your answer is correct.

Watch out—this gets tricky!

Example:

Statement: $x = 8$

Which is greater? $x + 5$ or $3x + 2$

Answer: $3x + 2 > x + 5$ because if $x = 8$, $3x + 2 = 26$, $x + 5 = 13$ and $26 > 13$.

Try it yourself:

1. Statement: $y < x$
   Which is greater? $x - y$ or $y - x$

2. Statement: $2x - 3 > 7$
   Which is greater? 5 or x

3. Statement: $10 - 2x < 6$
   Which is greater? x or 2

4. Statement: $4x \leq 0$
   Which is greater? 1 or x

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5. Statement: n is an integer
   Which is greater? n or $-n$

6. Statement $x > y$
   Which is greater? $x + a$ or $y + a$

7. Statement: $x > y$
   Which is greater? $x - a$ or $y - a$

8. Statement: $5 > 4$
   Which is greater? $5x$ or $4x$

9. Statement: $5 > 4$
   Which is greater? $\dfrac{5}{x}$ or $\dfrac{4}{x}$

10. Statement: $0 < x < 10$ and $0 < y < 12$
    Which is greater? x or y

11. Statement: $3^{n+2} \geq 27$
    Which is greater? n or 1

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READY, SET, GO!   Name   Period   Date

READY

Topic: Write an equation from a context. Interpret notation for inequalities.

Write an equation that describes the story. Then answer the question asked by the story.

1. Virginia's Painting Service charges $10 per job and $0.20 per square foot. If Virginia earned $50 for painting one job, how many square feet did she paint at the job?

2. Renting the ice-skating rink for a party costs $200 plus $4 per person. If the final charge for Dane's birthday party was $324, how many people attended his birthday party?

Indicate if the following statements are true or false. Explain your thinking.

3. The notation $12 < x$ means the same thing as $x < 12$. It works just like $12 = x$ and $x = 12$.

4. The inequality $-2(x + 10) \geq 75$ says the same thing as $-2x - 20 \geq 75$. I can multiply by -2 on the left side without reversing the inequality symbol.

5. When solving the inequality $10x + 22 < 2$, the second step should say $10x > -20$ because I added -22 to both sides and I got a negative number on the right.

6. When solving the inequality $-5x \geq 45$, the answer is $x \leq -9$ because I divided both sides of the inequality by a negative number.

7. The words that describe the inequality $x \geq 100$ are "*x is greater than or equal to 100.*"

SET
Topic: Solve inequalities. Verify that given numbers are elements of the solution set.
Solve for x. (Show your work.) Indicate if the given value of x is an element of the solution set.

8. $2x - 9 < 3$

9. $4x + 25 > 13$

Is this value part $x = 6$; *yes?*   *no?*   Is this value part $x = -5$; *yes?*   *no?*
of the solution set?   of the solution set?

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10. $6x - 4 \leq -28$ 11. $3x - 5 \geq -5$

Is this value part $x = -10;$ *yes?*   *no?*   Is this value part $x = 1;$ *yes?*   *no?*
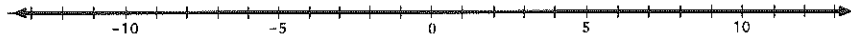of the solution set?   of the solution set?

Solve each inequality and graph the solution on the number line.
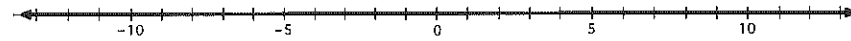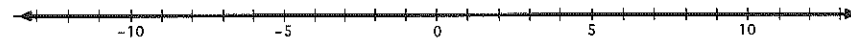
12. $x + 9 \leq 7$
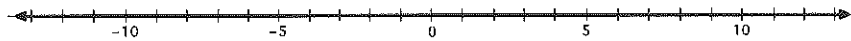
13. $-3x - 4 > 2$

14. $3x < -6$
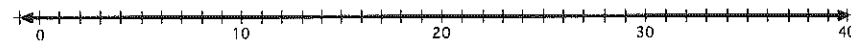
15. $\frac{x}{5} > -\frac{3}{10}$

16. $-10x > 150$

17. $\frac{x}{-7} \geq -5$

Solve each multi-step inequality.

18. $x - 5 > 2x + 3$ 19. $\frac{3(x-4)}{12} \leq \frac{2x}{3}$ 20. $2(x - 3) \leq 3x - 2$

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GO

Topic: Use substitution to solve linear systems

Solve each system of equations by using substitution.

Example: $\begin{cases} y = 12 \\ 2x - y = 14 \end{cases}$

The first equation states that $y = 12$. That information can be used in the second equation to find the value of x by replacing y with 12. The second equation now says $2x - (12) = 14$. Solve this new equation by adding 12 to both sides and then dividing by 2. The result is x = 13.

21. $\begin{cases} y = 5 \\ -x + y = 1 \end{cases}$

22. $\begin{cases} x = 8 \\ 5x + 2y = 0 \end{cases}$

23. $\begin{cases} 2y = 10 \\ 4x - 2y = 50 \end{cases}$

24. $\begin{cases} 3x = 12 \\ 4x - y = 5 \end{cases}$

25. $\begin{cases} y = 2x - 5 \\ y = x + 8 \end{cases}$

26. $\begin{cases} 3x = 9 \\ 5x + y = -5 \end{cases}$