1.9 Greater Than?
A Solidify 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.

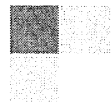Watch out—this gets tricky!

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 $26 > 13$.
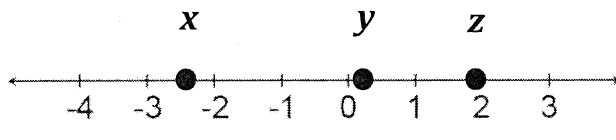
Try it yourself:

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: $4x = 0$
   Which is greater? 1 or x

5. Statement: $a > 0$, $b < 0$
   Which is greater? ab or $\dfrac{a}{b}$

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

7. Statement:
   Which is greater? 1 or yz

$$\begin{array}{c} x \qquad\qquad y \qquad z \\ \xleftarrow{\quad\;\;|\;\;\;|\;\;\bullet\;\;|\;\;\;|\;\;\;\bullet\;\;|\;\;\;|\;\;\;\bullet\;\;|\;\;\;\rightarrow} \\ \;-4\;\;-3\;\;-2\;\;-1\;\;\;0\;\;\;1\;\;\;2\;\;\;3 \end{array}$$

8. Statement: Use the number line in #7 and $x < w < y$
   Which is greater? w or $-y$

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

10. Statement: $3^{n+2} = 27$
    Which is greater? n or 3

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

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

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

14. Statement: $x > y$ and $a > b$
    Which is greater? $x - a$ or $y - b$

15. Statement: $x > 0, y > 0, \dfrac{x}{y} > 2$
    Which is greater? $2y$ or x