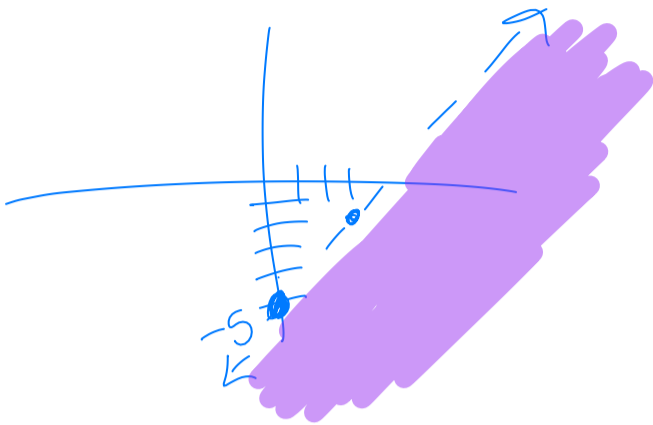


# Warmup

Solve for y, graph and shade

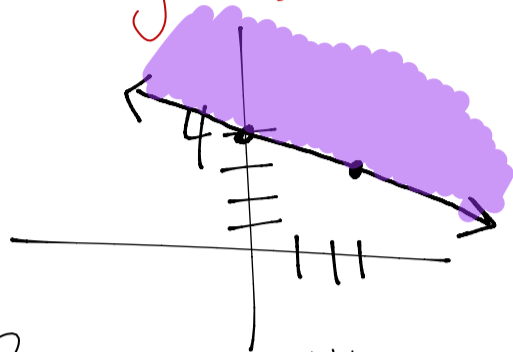
$$1) 4x - 3y > 15$$

$$\begin{array}{r} -4x \\ -3y > 15 - 4x \\ \hline -3y > \frac{15-4x}{-3} \\ y < -5 + \frac{4}{3}x \end{array}$$



$$2) x + 3y \geq 12$$

$$\begin{array}{r} -x \\ 3y \geq -x + 12 \\ \hline y \geq -\frac{1}{3}x + 4 \end{array}$$



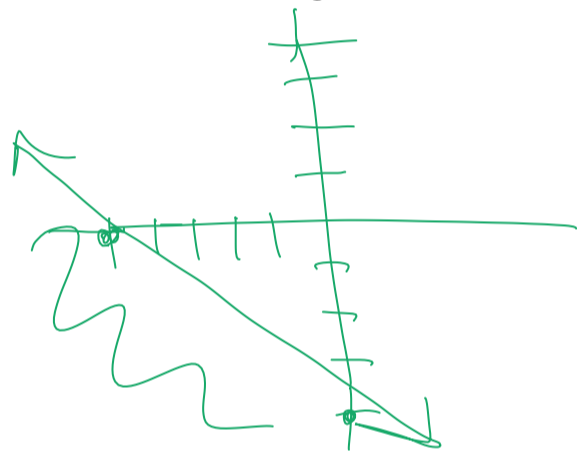
$$-4x - 5y \geq 20$$

$$\begin{array}{r} +4x \\ -5y \geq 4x + 20 \end{array}$$

$$\begin{array}{r} -5y \geq 4x + 20 \\ \hline -5y \geq \frac{4x+20}{-5} \end{array}$$

$$y \leq -\frac{4}{5}x - 4$$

$$2x + 7y > 14$$



$$2x + 7y > 14$$

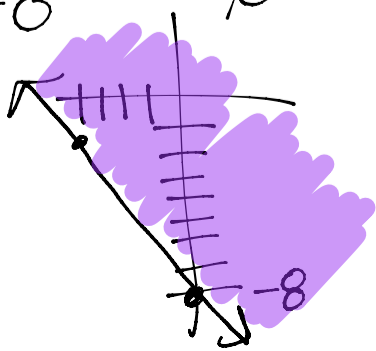


$$-14x - 8y \leq 64$$

$$\begin{array}{r} +14x \\ -8y \leq 14x + 64 \end{array}$$

$$\begin{array}{r} -8y \leq 14x + 64 \\ \hline -8y \leq \frac{14x+64}{-8} \end{array}$$

$$y \geq -\frac{7}{4}x - 8$$



# 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  $26 > 13$ .

$$\begin{array}{r} x+5 \\ 8+5 \\ 13 \end{array} \qquad \begin{array}{r} 3x+2 \\ 3(8)+2 \\ 26 \end{array}$$

$3x+2$  is greater  
b/c 26 greater than 13

Try it yourself:

$$y=4 \quad x=8$$

Let's pick two numbers that make the original statement true.

1. Statement:  $y < x$

Which is greater?  $x - y$  or  $y - x$

$$\begin{array}{r} 8-4 \\ 4 \end{array} \qquad \begin{array}{r} 4-8 \\ -4 \end{array}$$

Now test it out.

$x-y$  b/c positive # is greater than a neg #

2. Statement:  $2x - 3 > 7$

Which is greater? 5 or  $x$

$$x > 5$$

Solve for  $x$

Try to get  $x$  alone.

$x$  is greater b/c it is any # above 5.

3. Statement:  $10 - 2x < 6$

Which is greater?  $x$  or 2

$$\begin{array}{r} 10-2x < 6 \\ -10 \\ -2x < -4 \\ x > 2 \end{array}$$

$$\begin{array}{r} -2x < -4 \\ \frac{-2x}{-2} < \frac{-4}{-2} \\ x > 2 \end{array}$$

$x$  is greater b/c it is any # above 2

4. Statement:  $4x \leq 0$

Which is greater? 1 or  $x$

$$\frac{4x}{4} \leq \frac{0}{4}$$

$$x \leq 0$$

1 b/c  $x$  is 0 and any neg #

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

$n=7$   $n$  greater b/c  
 $-n=-7$  positive is greater than negative

List out what an integer is.

7 and -7 1 and -1

1, 2, 3, 4... -1, -2, -3, -4

What about 0?

$n=-4$   $-n$  greater

$-n=4$  b/c 2 negs multiply to get positive

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

$2+a$   $1+a$

$x=2$   $y=1$

$n=0$  equal  
 $-n=0$  equal

$x+a$  is greater b/c  $x$  is greater than  $y$

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

$2-a$   $1-a$

$2-5$   $1-5$   
 $-3$   $-4$

$x=2$   $y=1$

$x-a$  is greater b/c  $x$  is greater than  $y$

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

When  $x$  pos,  
 $5x$  bigger

$x=3$   
 $15$   $12$

What about 0?

$x=-2$

$-10$   $-8$

$4(0)=5(0)$  equal

When  $x$  neg,  
 $4x$  is bigger

9. Statement:  $5 > 4$

Which is greater?  $\frac{5}{x}$  or  $\frac{4}{x}$

When  $x$  positive,  $\frac{5}{x}$  greater  
When  $x$  neg,  $\frac{4}{x}$  greater

What about 0?

$x$  can never be 0

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

$y$  @ 10 and 11

All other options,  $x$  and  $y$  change spots

Between what two numbers can  $x$  be?

1, 2, 3, 4, 5, 6, 7, 8, 9

Between what two numbers can  $y$  be?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Are they the same? Where is  $y$  greater?

1-9

@ 10 & 11

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

$n+2 \geq 3$   
 $-2$   $-2$

$n \geq 1$

27  
9 3  
3 3

How many 3's make up 27?

3

Equal that number to  $n+2$ . Solve for  $n$ .

What about when  $n$  is negative?

equal @ 1

otherwise  $n$  is greater b/c any # above 1