Inspiring Greatness

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Algebra 1 S1

Graphing system of linear inequalities

May 5, 2020

Algebra I S1

Lesson: May 5, 2020

Objective/Learning Target:

Students can graph systems of linear inequalities given in standard form.

BELL RINGER-SLOPE INTERCEPT

Graph and find the solution:

$$y \geq -x - 1$$
$$y > -4x + 2$$

BELL RINGER-solution

Take one inequality at a time and graph. Let's take $y \geqslant -x - 1$ and split this step into two:

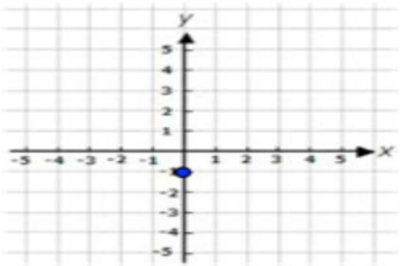
Remember:

$$y = mx + b$$

m= slope

b= y-intercept

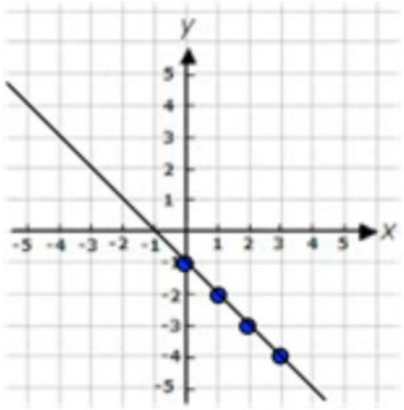
Your "starting point" is the y-intercept. Find this value on the y-axis and plot a point. So, our starting point is at -1 on the y-axis.



To find more points, we have to use the slope, which is $\frac{rise}{run}$. The slope in this example is $\frac{-1}{1}$ which means down one, right one. So, let's go back to our y-intercept and plot some more points.

BELL RINGER-solution

Step Three: Connect the points with a SOLID LINE if the inequality is $\leqslant$ (less than or equal to) or $\geqslant$ (greater than or equal to) and a DOTTED LINE if the inequality is (greater than). This first example is a solid line. So we have:

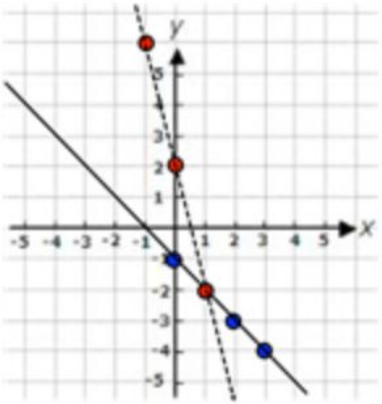


BELL RINGER-solution

Now, we have to do this all over again with the second inequality!

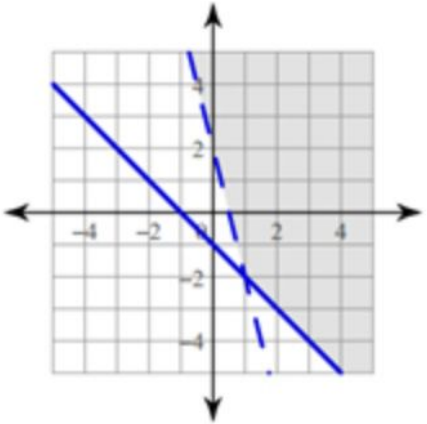
$$y > -4x + 2$$

This time our y-intercept is +2 and our slope is $\frac{-4}{1}$ which means down 4 and right 1. It is also a DOTTED LINE. So we now have:



BELL RINGER-solution

Step Four: We have to shade in part of our graph since there is more than one value that will work in our system of inequalities. For (greater than) or $\geqslant$ (greater than or equal to), we shade above the line (think of the line as a slide and that's "above"). In our example, both inequalities are the "above" inequalities so our shading must be above BOTH lines. Our final graph should look like:



STANDARD FORM

VIDEO: Graphing a linear system of inequalities in standard form

https://www.youtube.com/watch?v=5WC0umC16s4

EXAMPLE

- Graph the solution set of the system.

$$x + y \geq 3$$

$$x - y > 1$$

EXAMPLE-SOLUTION

- First, we graph $x + y \geq 3$ using a solid line.

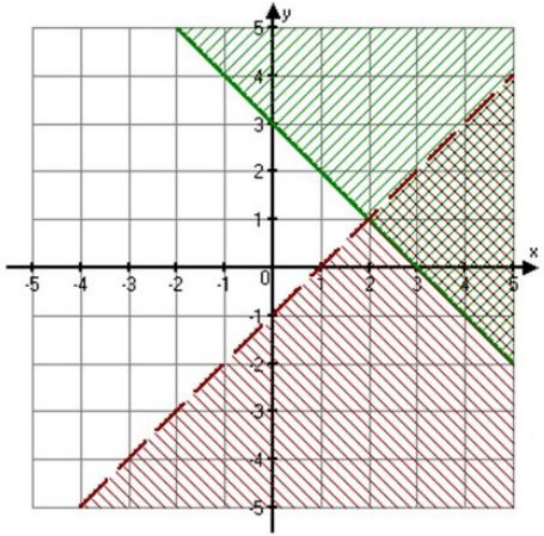
  Choose a test point (0, 0) and shade the correct plane.

- Next, we graph $x - y > 1$ using a dashed line.

  Choose a test point and shade the correct plane.

EXAMPLE-SOLUTION

The solution set of the system of equations is the region shaded both red and green, including part of the line $x + y \geq 3$.



PRACTICE PROBLEMS

ID: 1

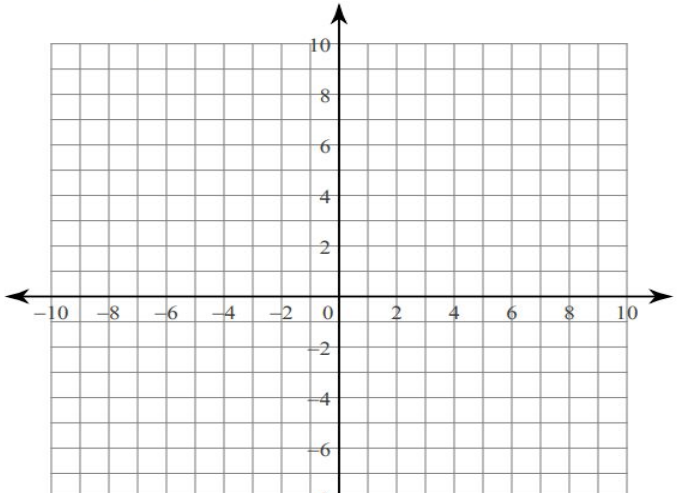
Name_____

Assignment

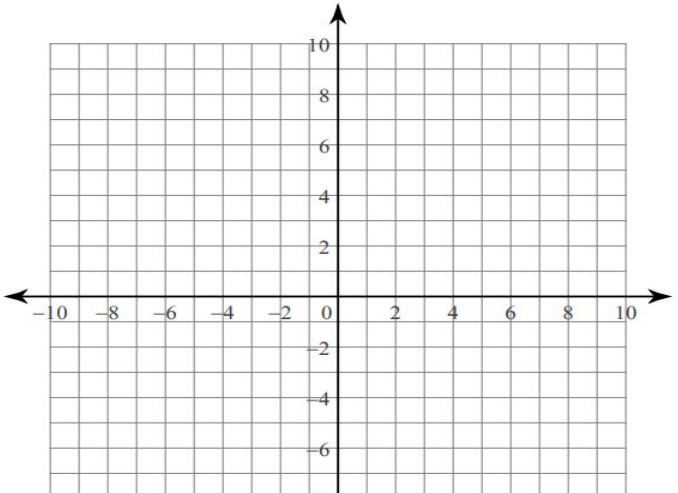
Date_____ Period____

Sketch the solution to each system of inequalities.

1) $3x + 7y < 35$
$12x + 7y > -28$

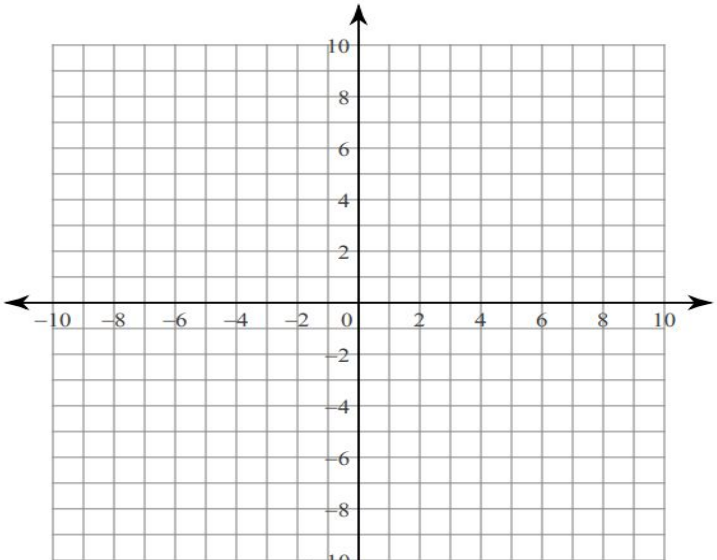


2) $x - y \geq -4$
$7x + 3y > -18$

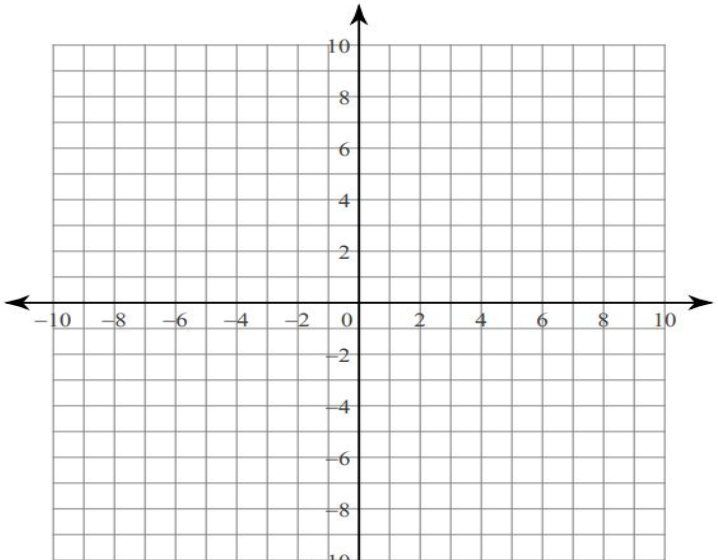


PRACTICE PROBLEMS

3) $7x + 2y \leq 8$
$7x + 2y \geq -2$

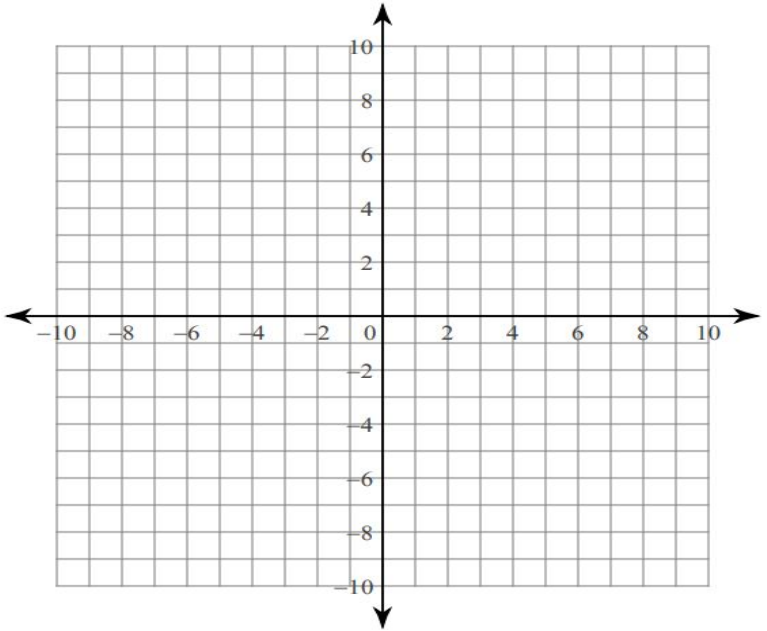


4) $14x - 3y \leq -24$
$14x - 3y \geq 3$

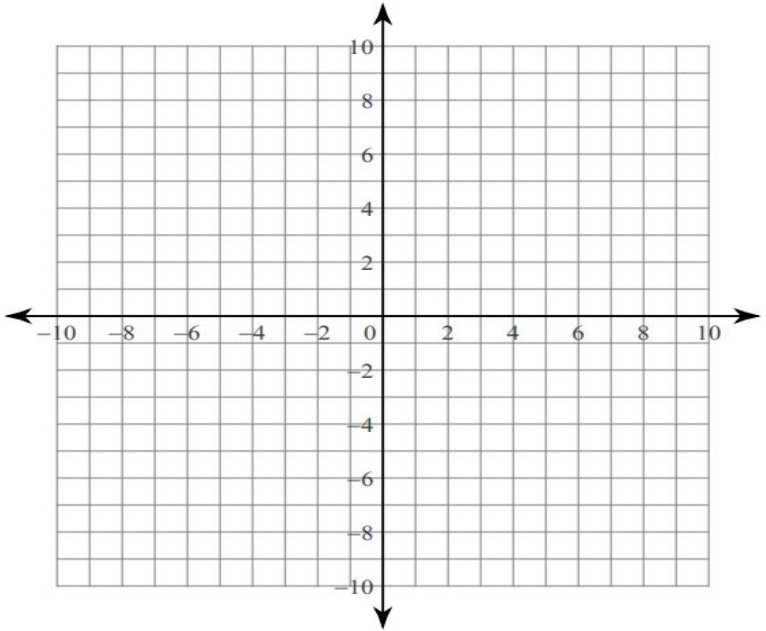


PRACTICE PROBLEMS

5) $x - 2y > -6$
$x \geq 2$

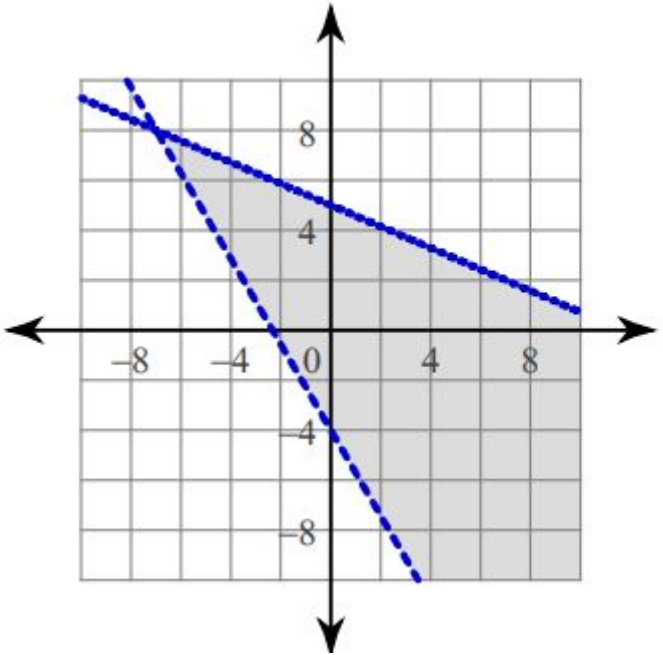


6) $x - 2y \geq -8$
$11x - 6y < 24$



PRACTICE PROBLEMS-SOLUTIONS

1)



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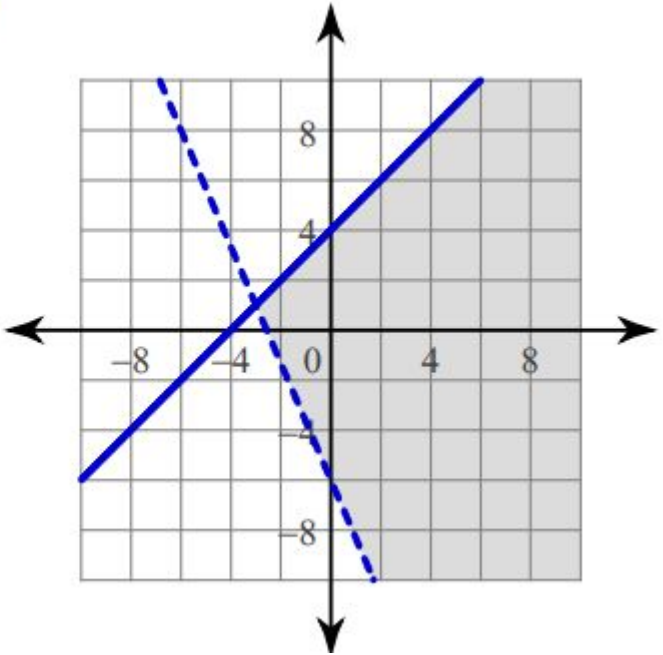
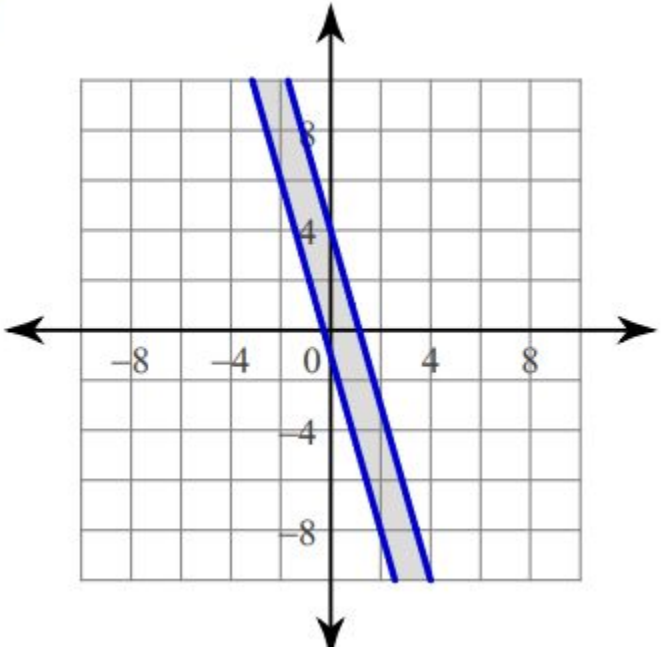


PRACTICE PROBLEMS-SOLUTIONS

3)



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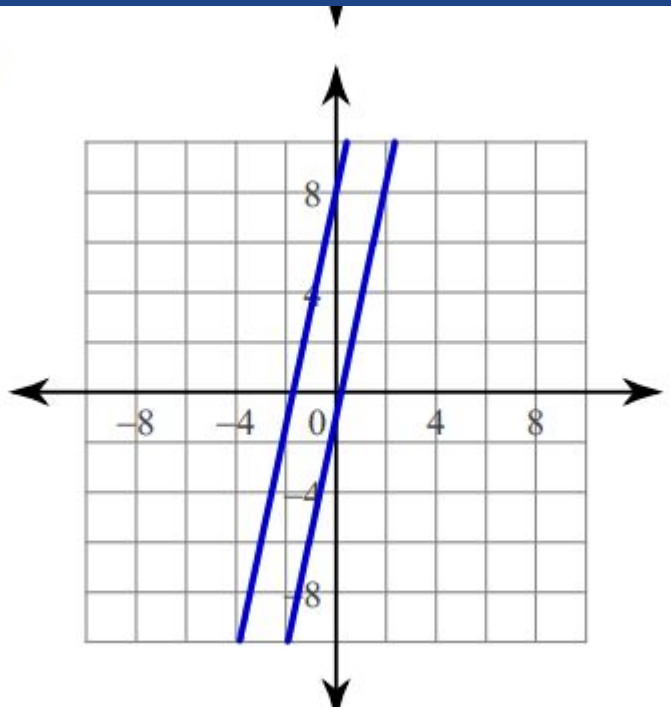
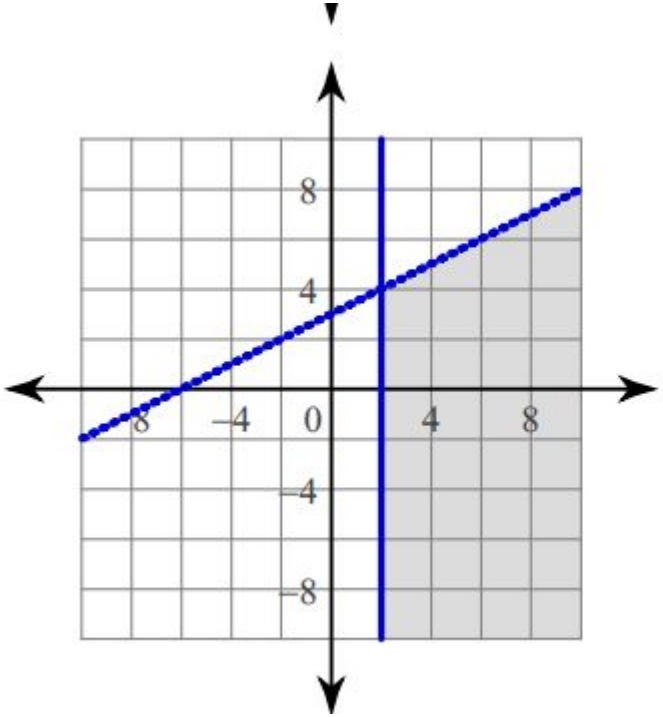
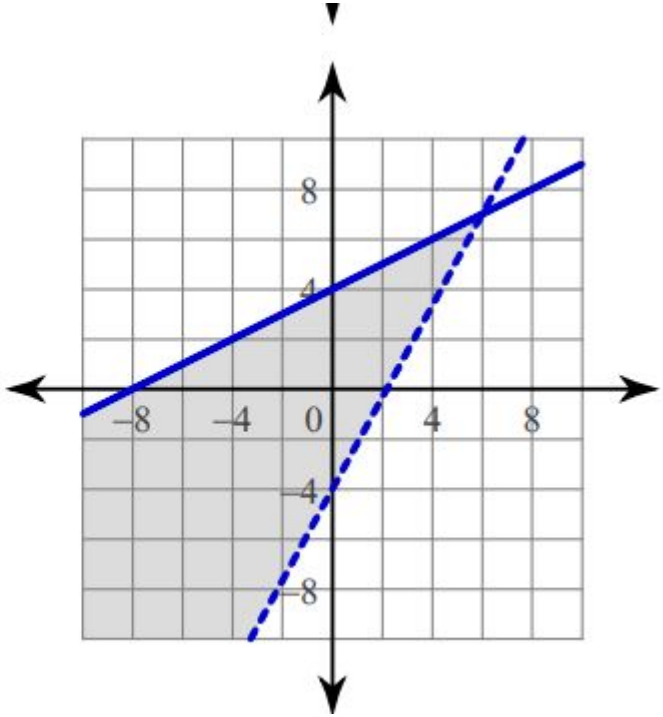


PRACTICE PROBLEMS-SOLUTIONS

5)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