CST/CAHSEE: Grade 7AF 4.1 **Review: Algebra 6.0**

$$-4n-3>-15$$

A) $n<-3$

B) $n<3$

C) $n>3$

D) $n<\ -$

How would a student come up with the other answers?

All About Inequality

How does Solving Inequalities apply to solving a System of Inequalities?

When we teach our students about graphing inequalities we are preparing them to solve and graph an inequality on a coordinate plane.

For example, when we teach students about an open versus closed circle, we are preparing them for a solid versus dashed line on a graph. When we teach shading to the left or right of this circle, we are preparing them for shading on either side of a line. In either graph we should be stressing that the circle and the line both act as boundaries in our solution. And a large part of the student's solution should be defining whether or not that boundary is part of the solution or not. Finally, in this lesson when we show the student the "Point" test, we are preparing them for the same point test we would use in a linear inequality.

* Note that using the Point Test, you want to pick a point other than your given point, i.e. if $x > 3$ then we will not choose 3 as a point to test. In the examples we use 0, which is always good to use, unless your solution is $n > 0$.

Solving Inequalities:

Let's review the inequality symbols:

<	less than
>	greater than
	less than or equal to
!	greater than or equal to

Determining the Truth of an Inequality – Students should understand that in an inequality there is not just one solution, but many solutions that will make the inequality true. However, students often struggle understanding the concept of inequality.

Example 1a.

$a + \; > \; ; a = -$

$- \; + \; >$

$- \; >$

$- \; >$

! 7 is not greater than 6, therefore this inequality is untrue.

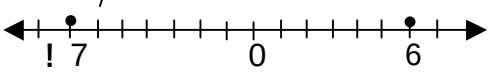
Example 1b.

We can also show this inequality by using a number line.

$a + \; > \; ; a = -$

$- \; + \; >$

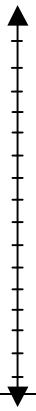
$- \; >$



Example 1c.

Another way to look at a number line.

By turning the number line vertical, students may be able to better recognize that -7 is less than .



Graphing an Inequality

Example 2a.

$x < 3$

$0 < 3$

This is a great opportunity to teach students how to use a critical point to find their solutions. Use the "Point Test" and replace x with any number less than 3. In this case we used "0". If the

This will also work if the number line is vertical.

Graphing an Inequality ÐTwo Dimensions

Example 3aÐOne Dimensionally

Example 3bÐ

We can graph $y < 2$ on a number line (as shown above).

$y < 2$

$0 < 2$

Solving Systems of Inequalities

To solve a system of inequalities we can graph both inequalities on the same coordinate plane.

$y < x + 2$

$y > 3 ! 2x$

On the graph to the right, the solutions to both inequalities have been shaded. In the area that has been shaded twice lays the point $3,2$. Its coordinates make both inequalities true as shown in the table below.

Your Turn!

Test the other points in the table below to see if they are solutions.

(x, y)	Is (x, y) in the double shaded region?	? $y < x + 2$	? $y > 3 ! 2x$	Is (x, y) a solution?
$(3,2)$				
$(6,! 1)$				
$(2,! 5)$	[redacted]			

[redacted]

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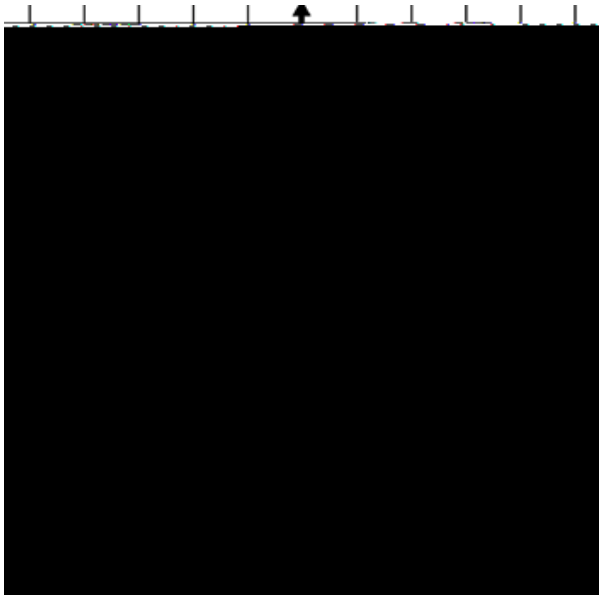
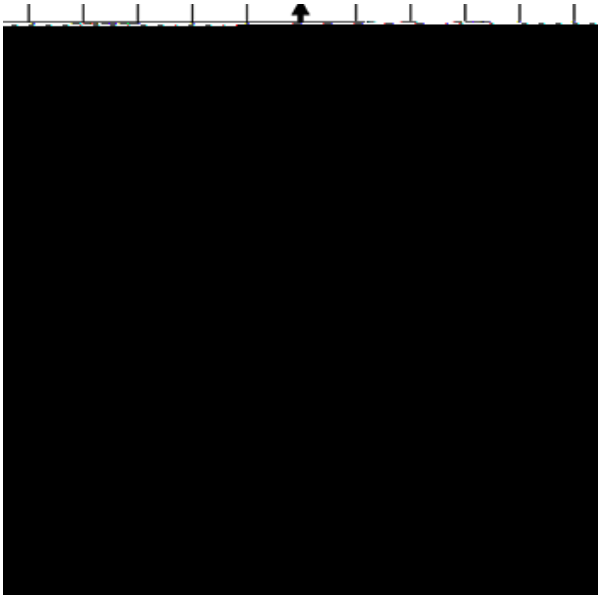
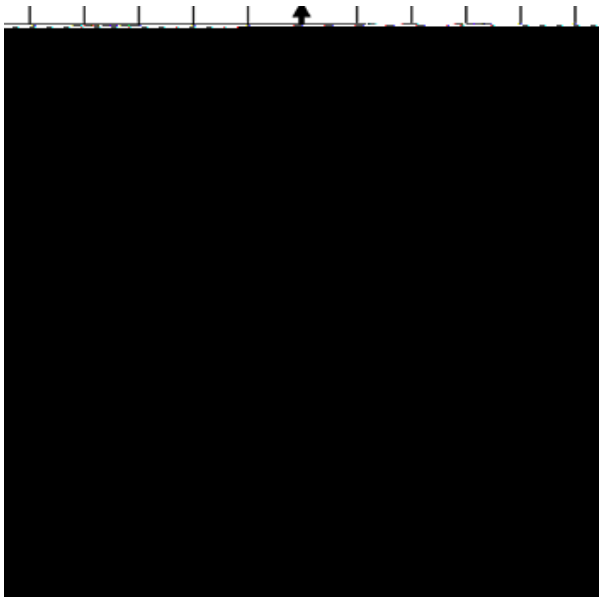
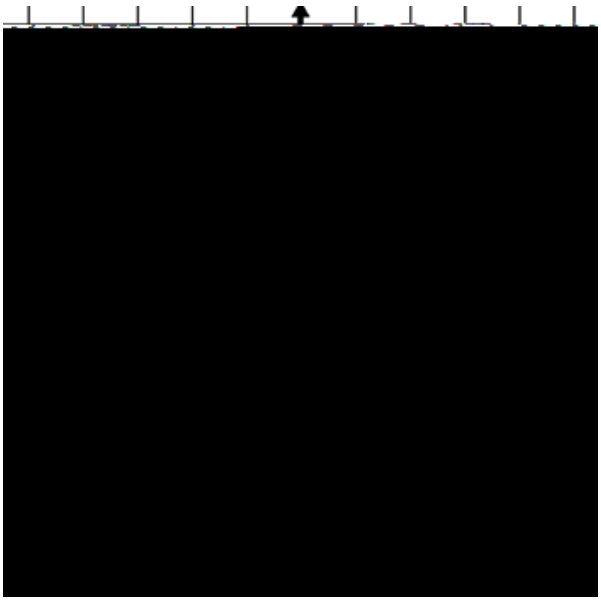
A

B

C

Independent Practice – Show the solution set for each system of inequalities.

$y > 2x - 5$ $y > -2x + 2$ 	$y > x - 3$ $y < -\frac{1}{2}x + 2$ 
$y \geq \frac{3}{5}x + 1$ $y \leq -x$ 	$y \geq \frac{2}{5}x + 3$ $y \geq -x + 3$ 

Worked Out Solutions

(x, y)	Is (x, y) in the double shaded region?	? $y < x + 2$	? $y > 3 - 2x$	Is (x, y) a solution?
$(3, 2)$	Yes	$2 \quad 3 \quad 2$ $2 \quad 5$		

Independent Practice Solutions

$y > 2x - 5$

$y > -2x + 2$