

3.3. Advanced Algebra Solving Systems of Inequalities

DATE: 11/13

Target 3D. Graph a system of inequalities to determine the feasible region and maximize or minimize the objective function



Solution: the solution of a system of inequalities is represented by the intersection of the graph.

LINE	SHADING
<ul style="list-style-type: none"> \geq and \leq draw a solid line \longleftrightarrow $>$ and $<$ draw a dashed line \longleftrightarrow 	<ul style="list-style-type: none"> \geq and $>$ shade "above" (where y is greater) \leq and $<$ shade "below" (where y is less)

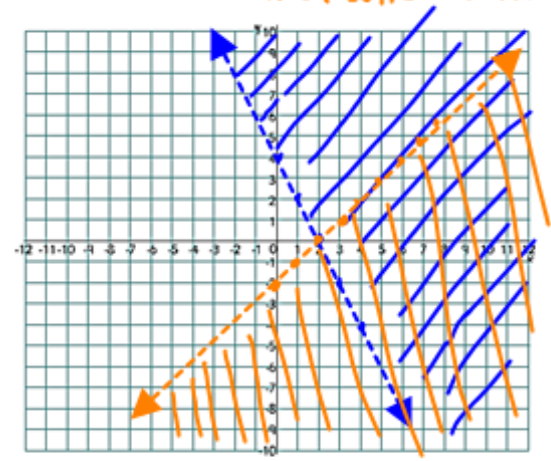
Shade: above

Examples: Graph each system of inequalities.

Slope: $-\frac{2}{1}$
y-int: 4
Line: dashed
Shade: above

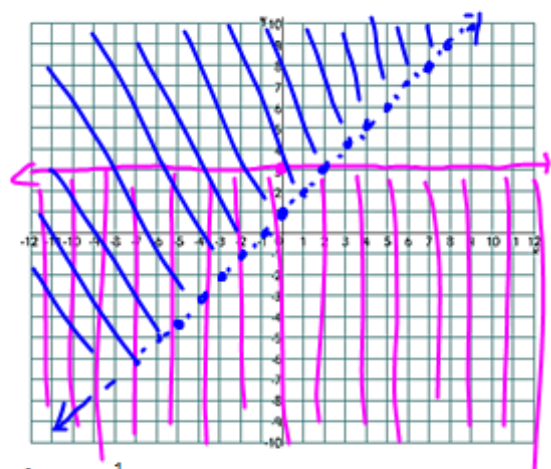
1. $y \geq -2x + 4$
 $y \leq x - 2$

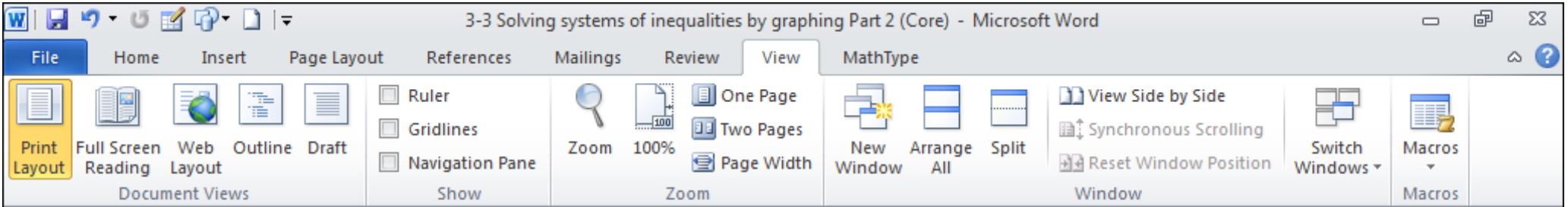
slope: $\frac{1}{1}$
y-int: -2
Line: solid shade: below



2. $y > x + 1$
 $y \leq 3$

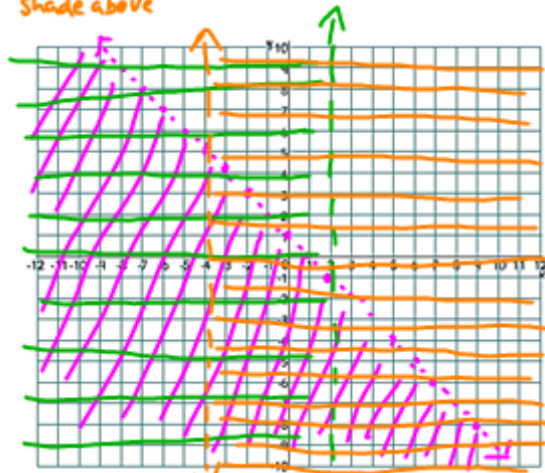
slope: $\frac{1}{1}$
y-int: +1 line: dashed
Horizontal line that's solid. Shade below.





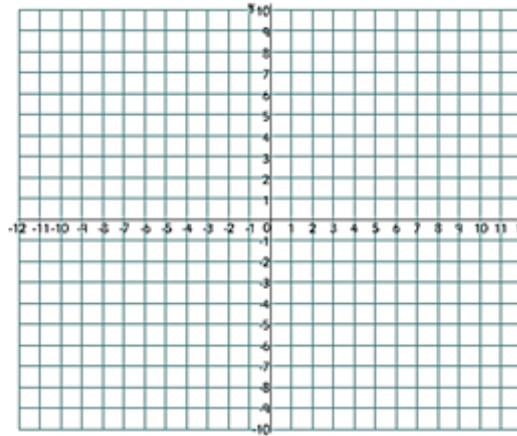
Vertical Lines Both dashed!

5. $y \leq -x + 1$ slope: $-\frac{1}{1} \rightarrow y\text{-int: } +1$
 $\begin{cases} x < 2 \text{ shade} \\ x > -4 \text{ below} \end{cases}$ Line: solid Shade: below
 shade above

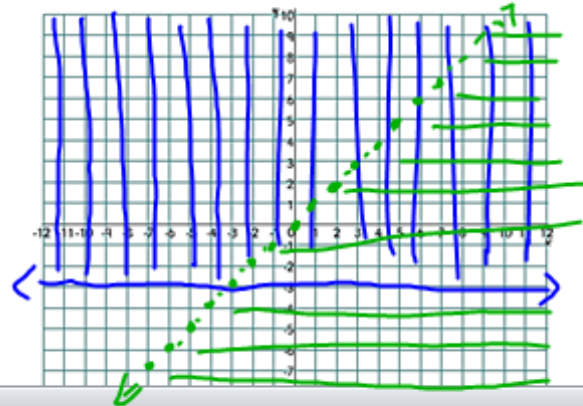


6. $y \leq 2x + 1$
 $y \leq -x + 1$
 $y \geq -\frac{1}{4}x + 1$

Try it!

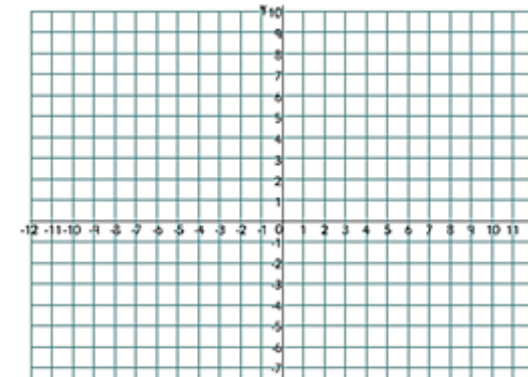


7. $y \leq x \rightarrow y \leq 1x + 0$ slope: $\frac{1}{1} \rightarrow y\text{-int: } 0$
 $y > -3$ Horizontal solid line. Shade above. dashed, shade below



8. $x \leq 4$
 $y > 2$

Try it!



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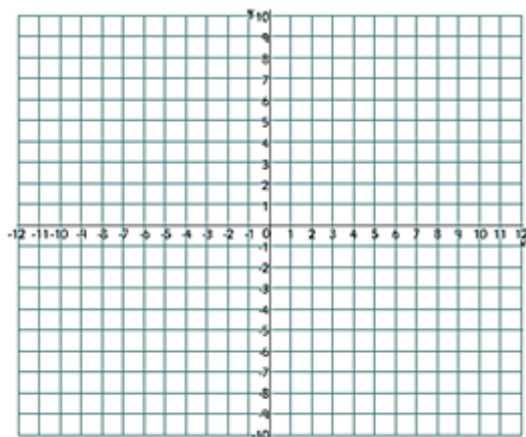
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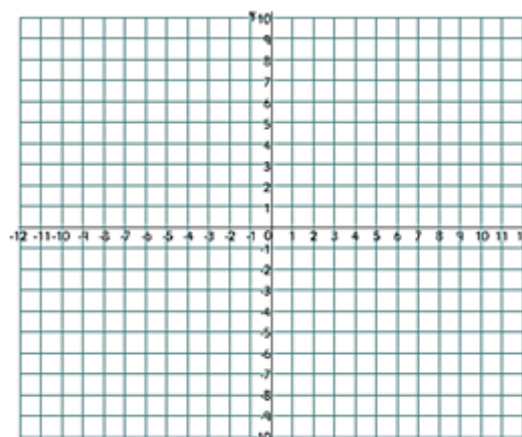
New Window Arrange All Split Window View Side by Side Synchronous Scrolling Reset Window Position Window

Switch Windows Macros

$$7. \begin{cases} y \leq x \\ y \geq -3 \end{cases}$$



$$8. \begin{cases} x \leq 4 \\ y > 2 \end{cases}$$



$$9. \begin{cases} x - 1 \leq 2 \\ x + y > 2 \end{cases}$$

$$\begin{array}{r} -x \quad -x \\ \hline y > -x + 2 \\ \hline \end{array}$$

Finish it!

$$\begin{array}{r} x - 1 \leq 2 \\ + 1 \quad + 1 \\ \hline x \leq 3 \\ \hline \end{array}$$

