

Algebra 2 3.2

Solve systems of inequalities by graphing

**Algebra 1 Ch. 5

Determine the coordinates of vertices of feasible regions

$y=mx+b$

slope

y-intercept

system of equations

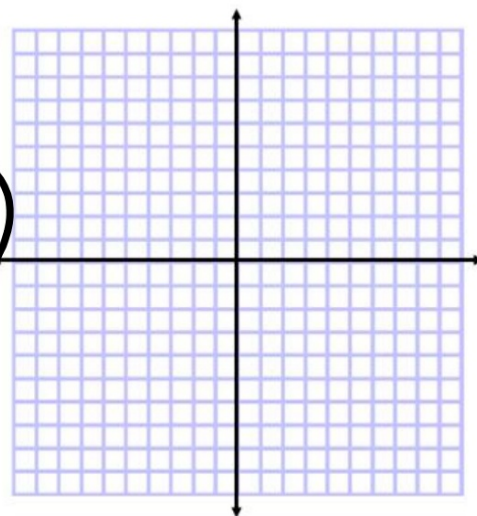
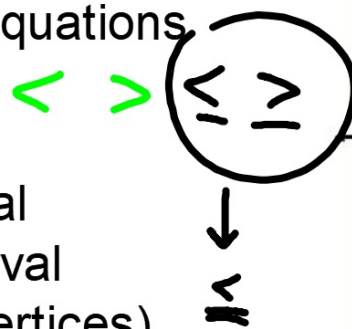
inequality < >

test point

open interval

closed interval

vertex (p. vertices)



whiteboards

KeyConcept Solving Systems of Inequalities



Step 1 Graph each inequality, shading the correct area.

Step 2 Identify the region that is shaded for all of the inequalities. This is the solution of the system.

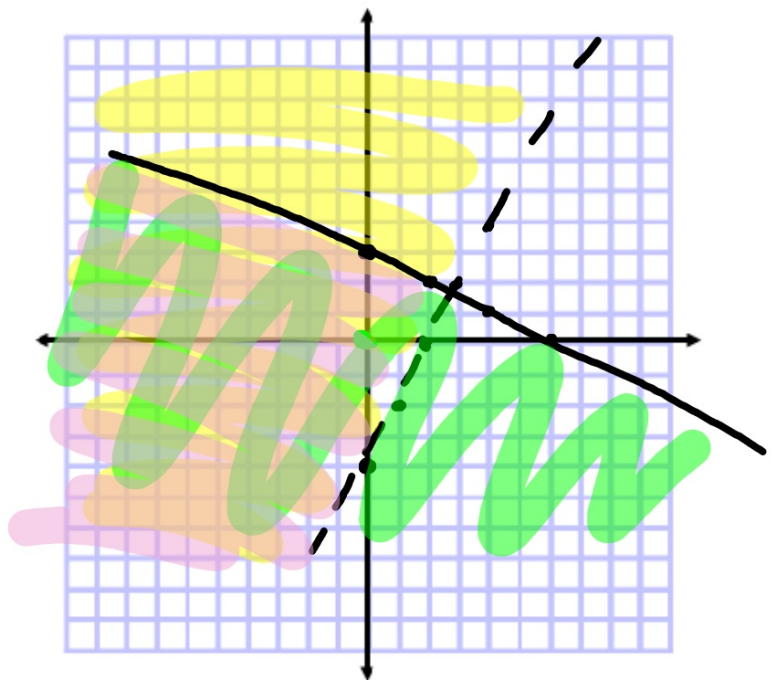
Example 1 Intersecting Regions

Solve the system of inequalities.

$$\begin{aligned} x &> 2y - 4 && 0 > -4 \\ y &\leq -\frac{1}{2}x + 3 && 0 \leq 3 \end{aligned}$$

$$y = \frac{1}{2}x - 4$$

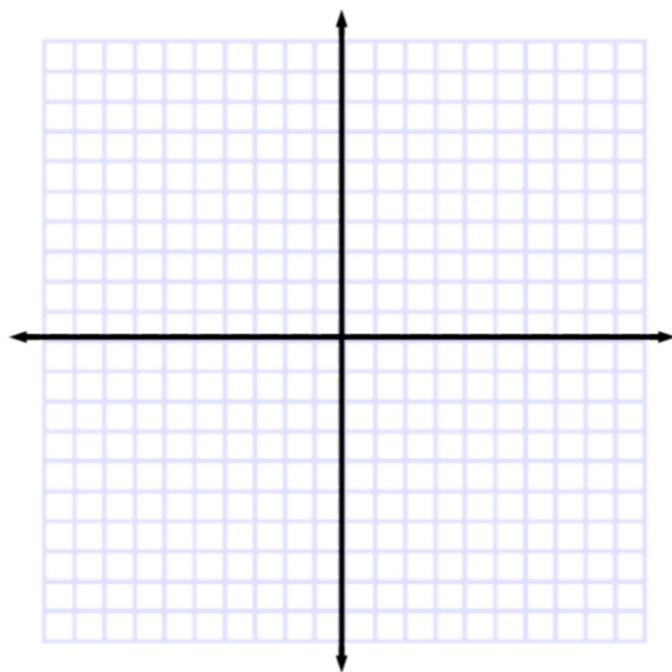
$$y = -\frac{1}{2}x + 3$$



Guided Practice

1A. $y \leq -2x + 5$

$$y > -\frac{1}{4}x - 6$$

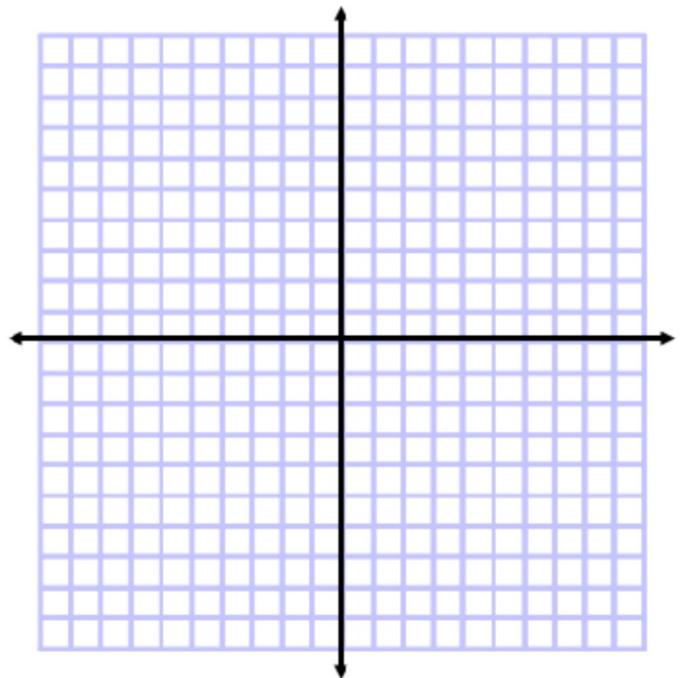


Example 2 Separate Regions

Solve the system of inequalities by graphing.

$$y \geq x + 5$$

$$y < x - 4$$



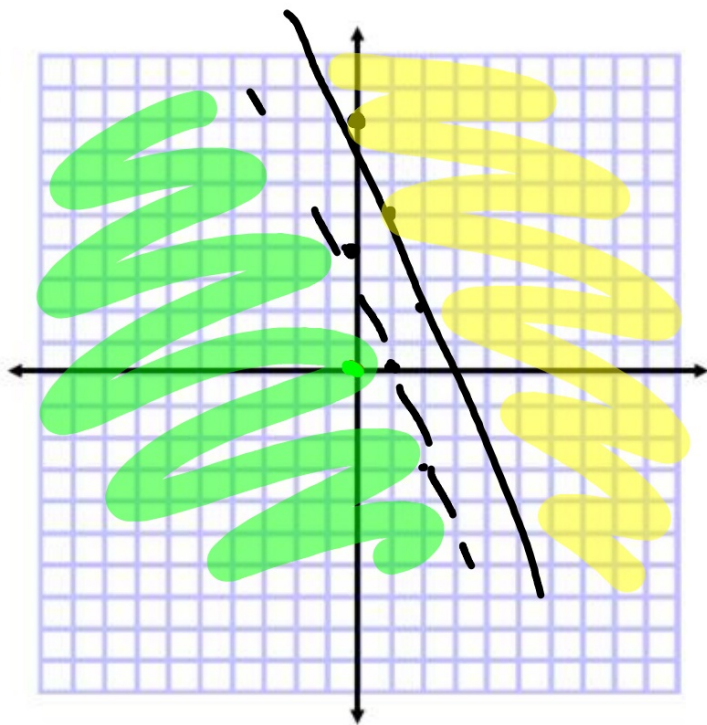
Guided Practice

2A. $0 \geq -4x + 8$ $0 > 8$

$0 < -4x + 4$

$0 < y$

No Sol.



Graph & shade. Locate the feasible region. Answer the question.

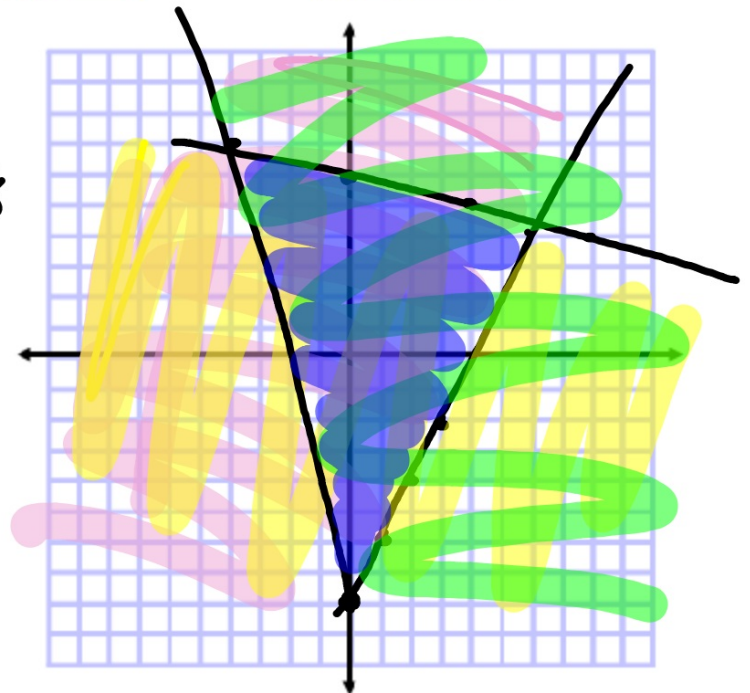


Example 4 Find Vertices

Find the coordinates of the vertices of the triangle formed by $y \geq 2x - 8$,
 $y \leq -\frac{1}{4}x + 6$, and $4y \geq -15x - 32$.

$(0, -8)$
 $(-4, 7)$
 $(6, 4)$

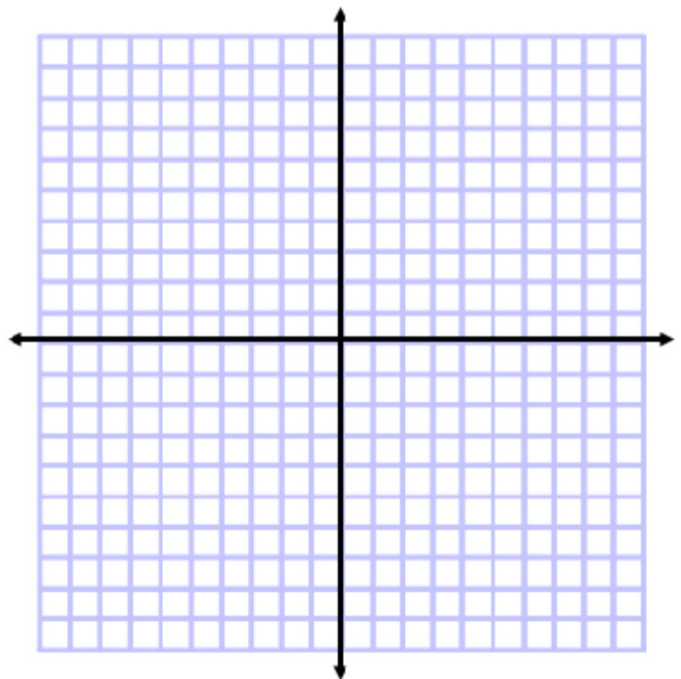
$$y \geq -\frac{15}{4}x - 8$$



GuidedPractice

Find the coordinates of the vertices of inequalities.

4A. $y \geq -3x - 6$
 $2y \geq x - 16$
 $11y + 7x \leq 12$



Can you drive for a negative number of hours?

Guided Practice

3. **TRAVEL** Mr. and Mrs. Rodriguez are driving across the country with their two children. They plan on driving a maximum of 10 hours each day. Mr. Rodriguez wants to drive at least 4 hours a day but no more than 8 hours a day. Mrs. Rodriguez can drive between 2 and 5 hours per day. Write and graph a system of inequalities that represents this information.

$$m_x + m_y \leq 10$$

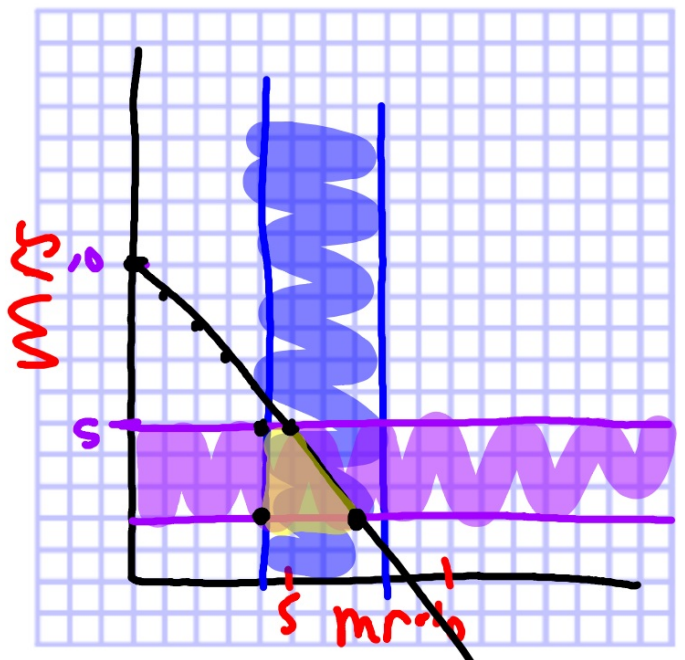
$$4 \leq m_x \leq 8$$

$$2 \leq m_y \leq 5$$

$$x + y \leq 10$$

$$* y < -x + 10$$

$$\begin{aligned} &(5, 5) \\ &(4, 5) \\ &(4, 2) \\ &(7, 2) \end{aligned}$$



Can you study for a negative number of hours?



Real-World Example 3 Write and Use a System of Inequalities

TIME MANAGEMENT Chelsea has final exams in calculus, physics, and history. She has up to 25 hours to study for the exams. She plans to study history for 2 hours. She needs to spend at least 7 hours studying for calculus, but over 14 is too much. She hopes to spend between 8 and 12 hours on physics. Write and graph a system of inequalities to represent the situation.

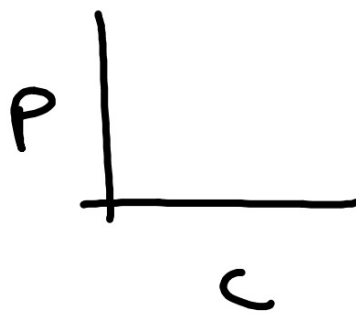
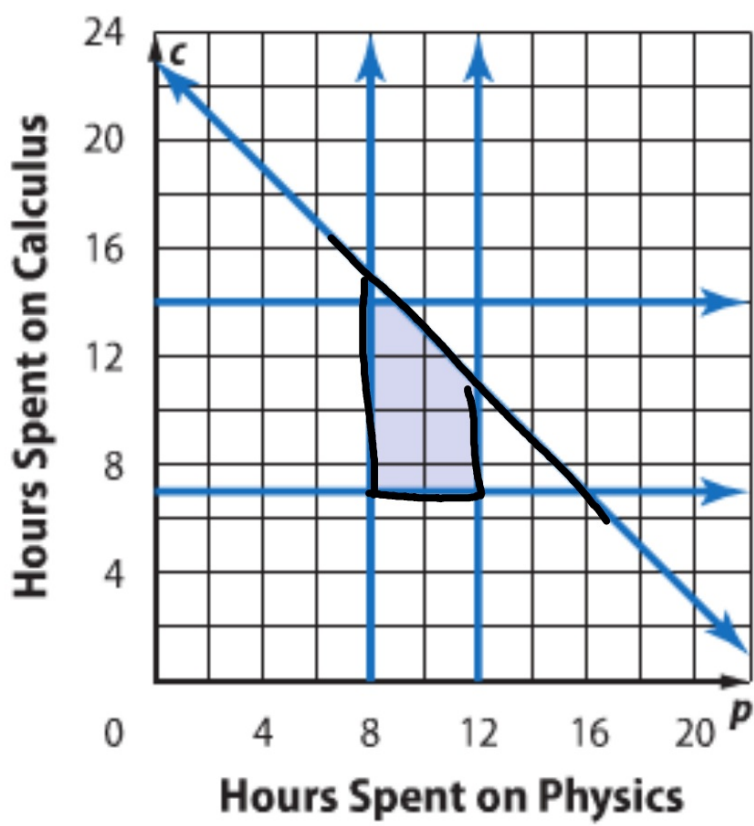
$$2 + c + p \leq 25$$

$$7 \leq c \leq 14$$

$$8 \leq p \leq 12$$



next...



~~IIII~~
~~IIII~~
IIII

3. 2

7-250

29 -

31 0