

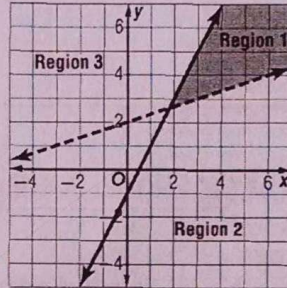
Notes Solving Systems of Inequalities

Systems of Inequalities To solve a system of inequalities, graph the inequalities in the same coordinate plane. The solution of the system is the region shaded for all of the inequalities.

Example: Solve the system of inequalities.

$$y \leq 2x - 1 \text{ and } y > \frac{x}{3} + 2$$

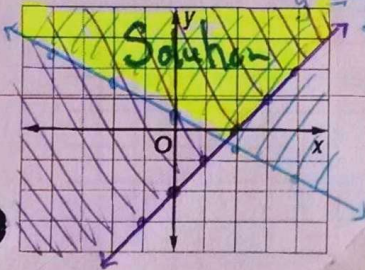
The intersection of these regions is Region 1, which is the solution set of the system of inequalities.



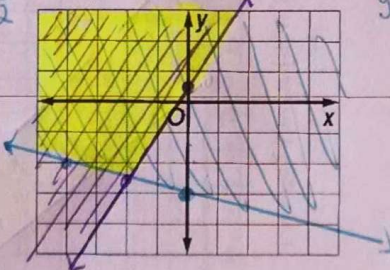
Exercises

Solve each system of inequalities by graphing.

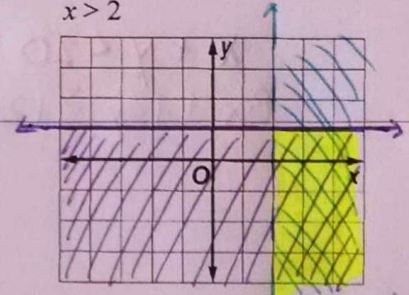
1. $x - y \leq 2$
 $x + 2y \geq 1$



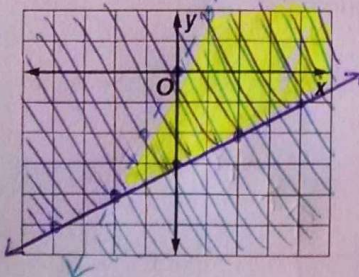
2. $3x - 2y \leq -1$
 $x + 4y \geq -12$



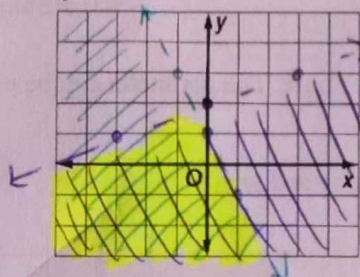
3. $y \leq 1$
 $x > 2$



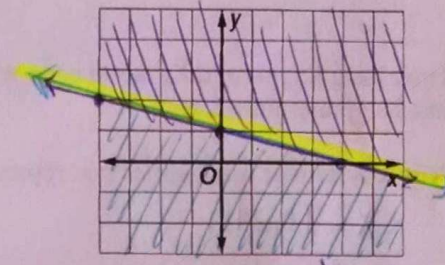
4. $y \geq \frac{x}{2} - 3$
 $y < 2x$



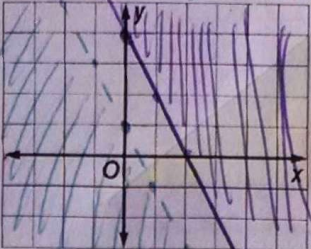
5. $y < \frac{1}{3}x + 2$
 $y < -2x + 1$



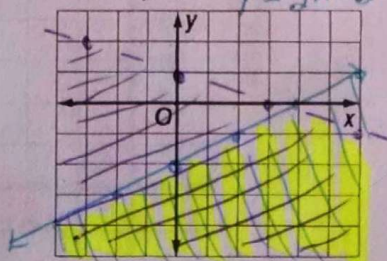
6. $y \geq -\frac{x}{4} + 1$
 $-x - 4y \geq -4$



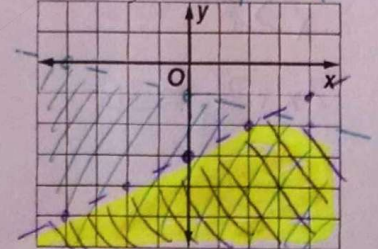
7. $y \geq -2x + 4$
 $2x + y < 1$



8. $x + 3y < 3$
 $x - 2y \geq 4$



9. $x - 2y > 6$
 $x + 4y < -4$



Determine whether the given point is a solution to the system of Inequalities.

$(0, 0) ; \begin{cases} y > 2 \\ y - 2 < x \end{cases}$	$(2, 3) ; \begin{cases} y \geq x + 4 \\ y \leq 2x + 4 \end{cases}$
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Paul earns \$8 per hour at the bagel shop and \$12 per hour mowing lawns. Paul needs to earn at least \$120 per week, but he can only work less than 20 hours each week.

Write a system of equations that represents this situation and graph the solution.

x : hours @ Bagel shop
 y : hours mowing lawns

$$\begin{aligned} 8x + 12y &\geq 120 \\ x + y &< 20 \end{aligned}$$



Manuel is going to build a rabbit cage with a rectangular base. The perimeter can be no more than 30 feet and the length must be greater than 8 feet.

Write a system of inequalities that represents this situation and graph the solution.

x : Length
 y : width
 $x > 8$
 $2x + 2y \leq 30$

