Section 7.5 Systems of Linear Inequalities.

Graph both inequalities on the same axes. The intersection of the shaded region is the solution set.

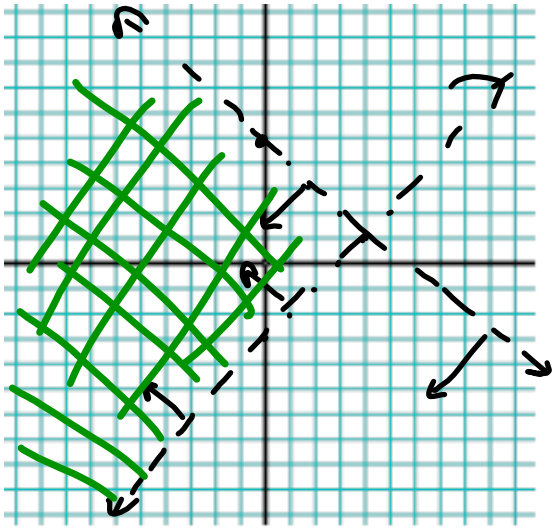
Example 1

$x + y < 5$
$x - y < 3$

$y < -x + 5$

$-y < -x + 3$

$y > x - 3$



Example 2

$4x - 2y \geq 8$

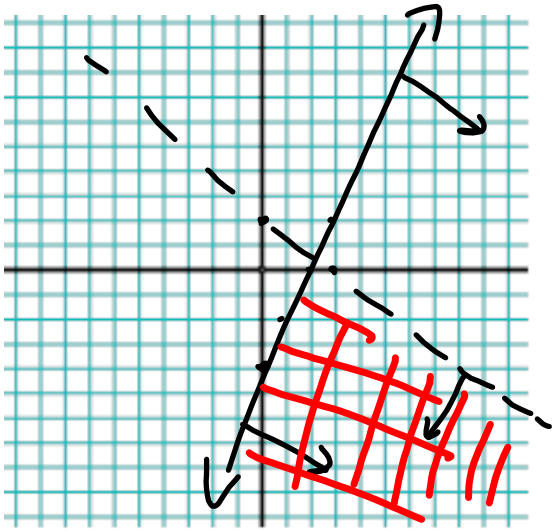
$2x + 3y < 6$

$-2y \geq -4x + 8$

$y \leq 2x - 4$

$3y < -2x + 6$

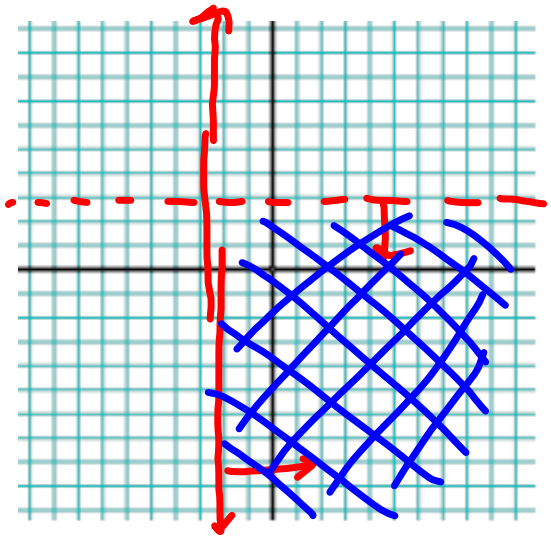
$y < -\frac{2}{3}x + 2$



Example 3

$x \geq -2$

$y < 3$



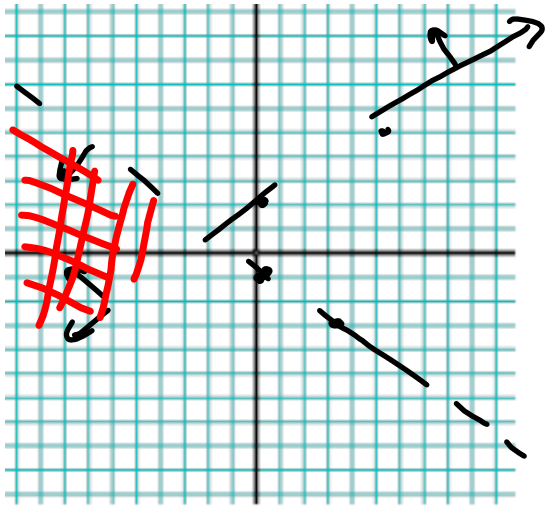
Example 4

$5y > 3x + 10$

$3y < -2x - 3$

$y \geq \frac{3}{5}x + 2$

$y < -\frac{2}{3} - 1$



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21. Julie makes small and large decorated bowls. It takes Julie 20 minutes to decorate a small bowl and 30 minutes to decorate a large bowl. She can spend no more than a total of 600 minutes decorating the bowls. The number of small bowls made needs to be at least twice the number of large bowls made. Julie must also make at least 10 small bowls and 5 large bowls.

a) Translate this problem into a system of linear inequalities.
b) Graph the sales for small bowls on the x axis and large bowls on the y axis.
c) Select a point in the solution set that represents one possible set of sales.

$x = 5m$

$y = 19$

$20x + 30y \leq 600$

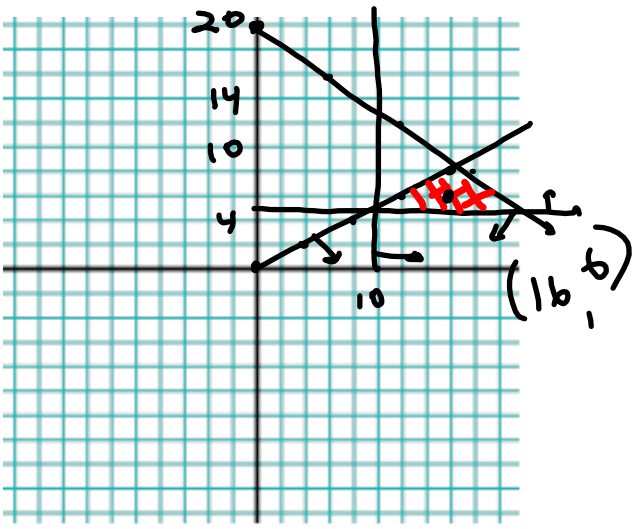
$\frac{x}{2} \geq \frac{2}{2}y \quad \frac{1}{2}x \geq y$

$x \geq 10$

$y \geq 5$

$30y \leq -20x + 600$

$y \leq \frac{-2}{3}x + 20$



22. Ruben is on a special diet. He must consume fewer than 500 calories at a meal that consists of one serving of chicken and one serving of rice. The meal must contain at least 150 calories from each source.

a) translate this problem into a system of inequalities.

b) Graph calories from chicken on the x axis and rice on the y axis.

c) There are 180 calories in 3 oz. of chicken and about 200 calories in 8 oz. of rice. Select a point in the solution set. For the point selected, determine the number of ounces of chicken and the number of ounces of rice to be served.