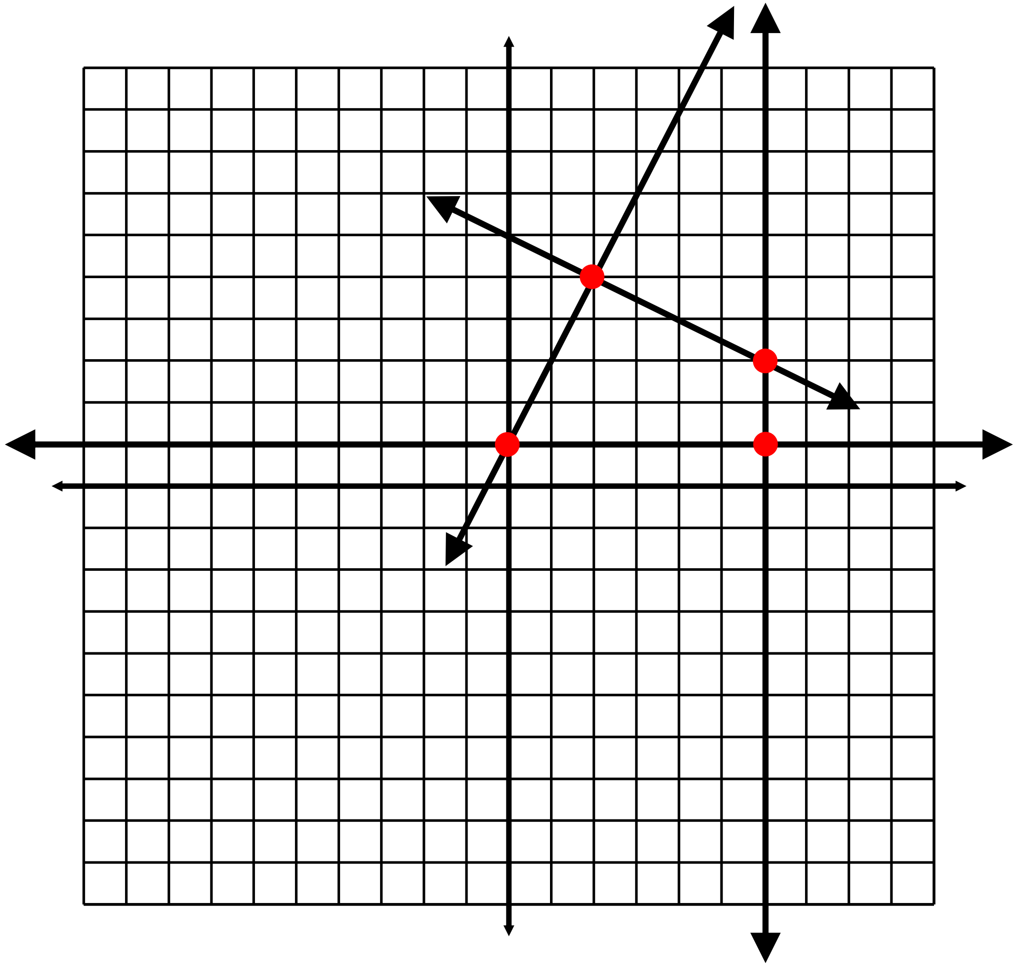
Bell Work

1. If $f(x) = 2x^2 - 3x + 7$, then what is $f(3)$?
2. Is (3, -5) a solution for $3x = -1 - 2y$?
3. What is the vertex of $y = |2x + 8| - 4$?
4. What is the range in interval notation of the absolute value parent function?

Graph $\begin{cases} x \le 6 \\ y \ge 1 \\ y \le 2x + 1 \\ y \le -\frac{1}{2}x + 6 \end{cases}$

Graph the system of inequalities, then find the vertices.

(0, 1)
(2, 5)
(6, 1)
(6, 3)



Maximize $P = 2x - 3y$

$P = 2(0) - 3(1) = -3$

$P = 2(2) - 3(5) = -11$

$P = 2(6) - 3(1) = 9$

$P = 2(6) - 3(3) = 3$

Put each vertex into the function and solve. Pick the one that works for the function. Here we pick the largest number.

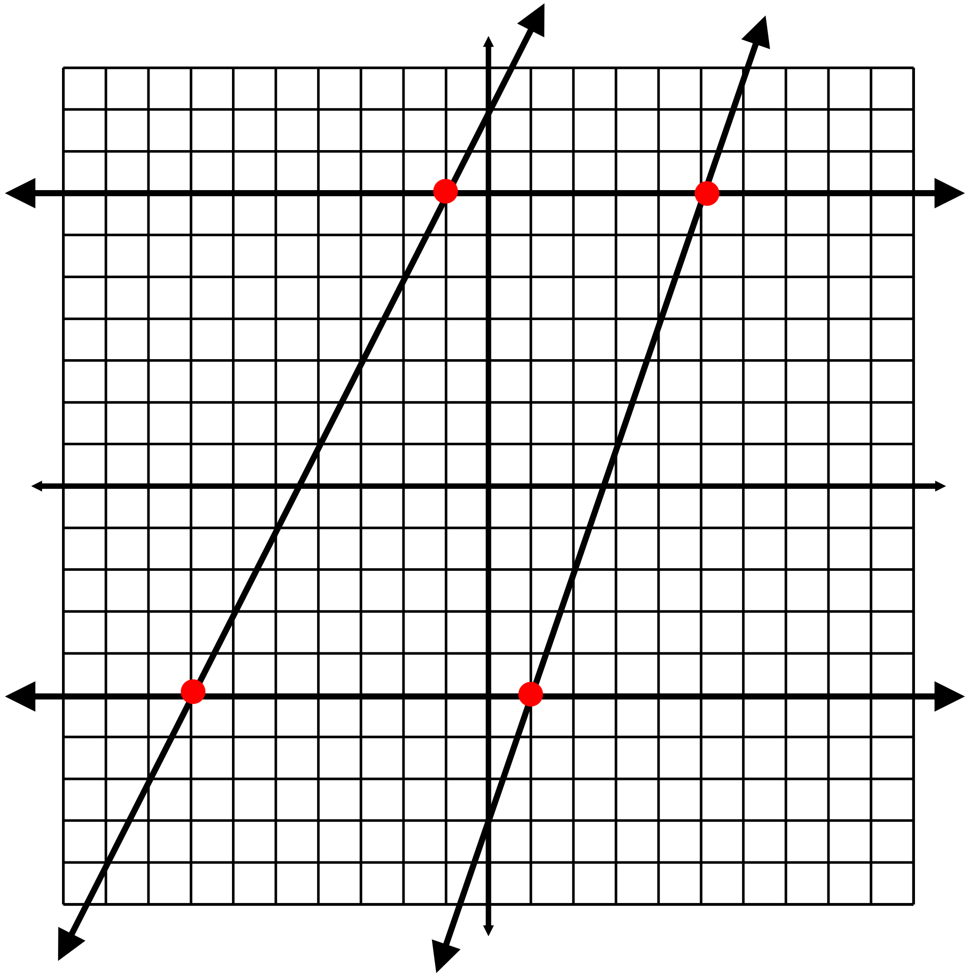
(6, 1); 9

The feasible region is located within the inequalities.

Graph $\begin{cases} y \le 7 \\ y \ge -5 \\ y \le 2x+9 \\ y \ge 3x-8 \end{cases}$.

Graph the system of inequalities, then find the vertices.

(-7, -5)
(1, -5)
(-1, 7)
(5, 7)



Minimize $P = 3x + 2y - 4$

$P = 3(-7) + 2(-5) - 4 = -35$

$P = 3(1) + 2(-5) - 4 = -11$

$P = 3(-1) + 2(7) - 4 = 7$

$P = 3(5) + 2(7) - 4 = 25$

Put each vertex into the function and solve. Pick the one that works for the function. Here we pick the smallest number.

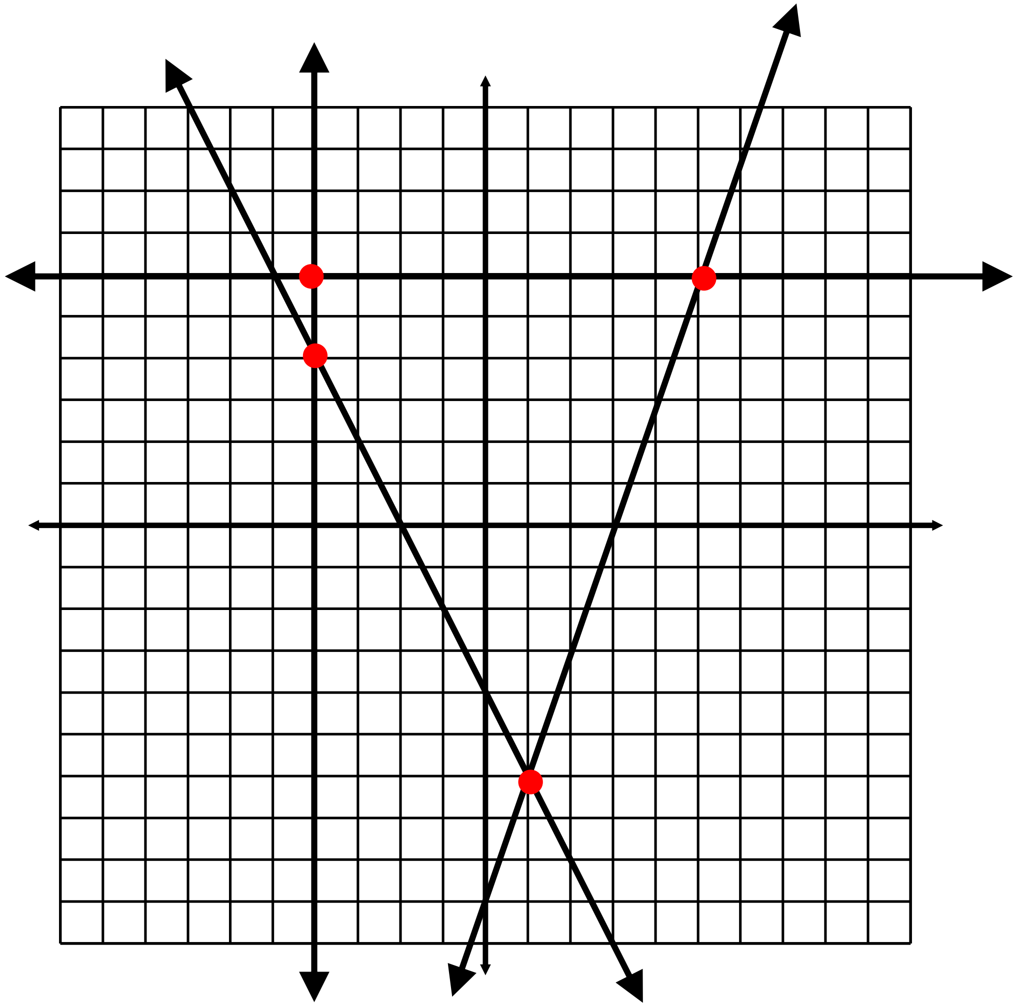
(-7, -5); -35

The feasible region is located within the inequalities.

Graph $\begin{cases} x \geq -4 \\ y \leq 6 \\ y \geq 3x - 9 \\ y \geq -2x - 4 \end{cases}$.

Graph the system of inequalities, then find the vertices.

(-4, 4)
(-4, 6)
(1, -6)
(5, 6)



The feasible region is located within the inequalities.

Minimize $P = 4x - y + 3$

$P = 4(-4) - 4 + 3 \quad = -17$

$P = 4(-4) - 6 + 3 \quad = -19$

$P = 4(1) - (-6) + 3 \quad = 13$

$P = 4(5) - 6 + 3 \quad = 17$

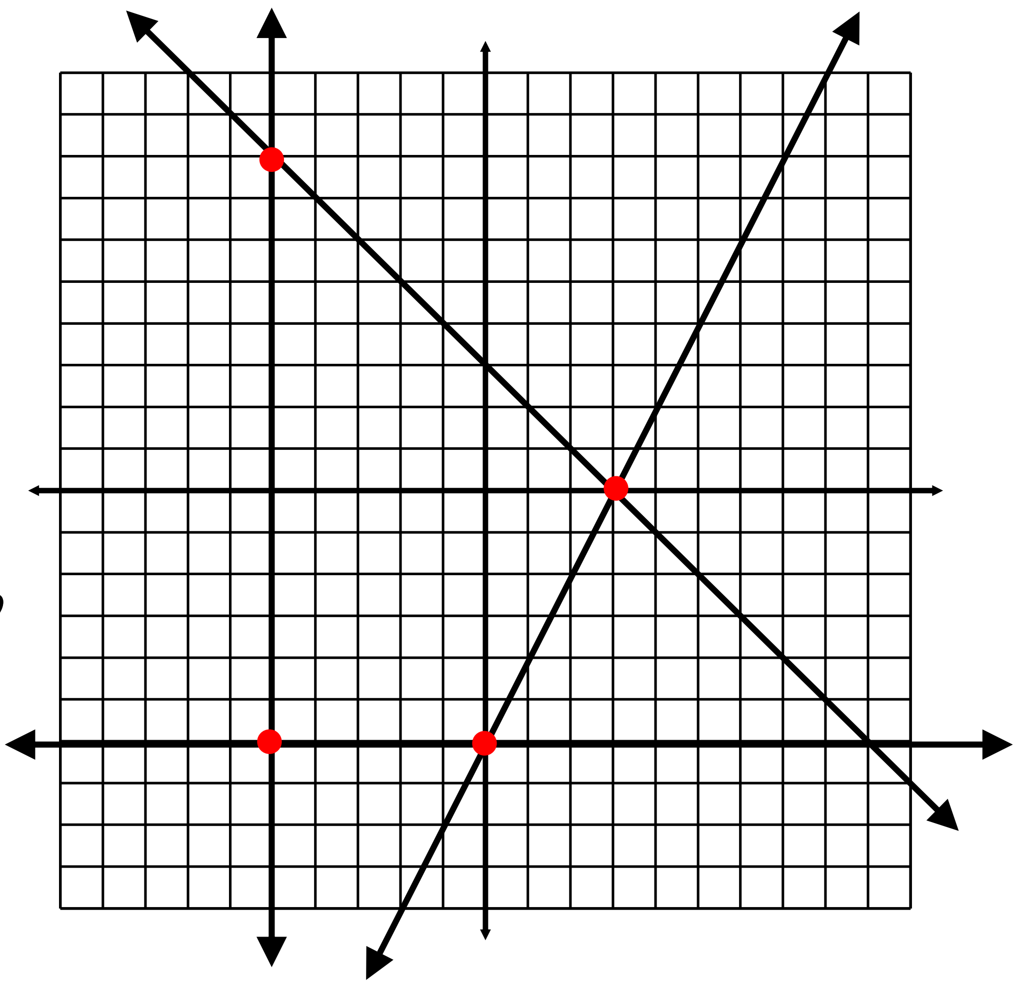
Put each vertex into the function and solve. Pick the one that works for the function. Here we pick the smallest number.

(-4, 6); -19

Graph $\begin{cases} x \geq -5 \\ y \geq -6 \\ y \leq x + 3 \\ y \geq -2x - 6 \end{cases}$.

Graph the system of inequalities, then find the vertices.

(-5, 8)
(-5, -6)
(0, -6)
(3, 0)



Maximize $P = 5x + 3y + 8$

$P = 5(-5) + 3(8) + 8 \quad = 7$

$P = 5(-5) + 3(-6) + 8 \quad = -35$

$P = 5(0) + 3(-6) + 8 \quad = -10$

$P = 5(3) + 3(0) + 8 \quad = 23$

Put each vertex into the function and solve. Pick the one that works for the function. Here we pick the largest number.

(3, 0); 23

The feasible region is located within the inequalities.

Assignment:

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#2 and #5 go together

#3 and #6 go together

#4 and #7 go together

#9 and #12 go together

#10 and #13 go together

#11 and #14 go together

Graph each feasible region.

2. $\begin{cases} x \geq 0 \\ y \geq 0 \\ y \leq 3x + 3 \\ y \leq -x + 7 \end{cases}$

3. $\begin{cases} x \geq 0 \\ y \geq -1 \\ y \leq x + 1 \\ y \leq -\frac{1}{4}x + 6 \end{cases}$

4. $\begin{cases} x \geq -2 \\ y \leq 1 \\ y \geq 0.5x - 2 \\ y \leq -2x + 3 \end{cases}$

Maximize or minimize each objective function.

5. Maximize $P = 10x + 16y$ for the constraints from Exercise 2.

6. Minimize $P = 3x + 5y$ for the constraints from Exercise 3.

7. Maximize $P = 2.4x + 1.5y$ for the constraints from Exercise 4.

Graph each feasible region.

9. $\begin{cases} x \geq 0 \\ y \geq 0 \\ y \geq 4x - 4 \\ y \leq x + 5 \end{cases}$

10. $\begin{cases} x \leq 0 \\ y \geq 0 \\ y \leq 9 \\ y \geq -2x - 7 \end{cases}$

11. $\begin{cases} x \geq 0 \\ x \leq 5 \\ y \geq \frac{1}{5}x - 3 \\ y \leq -x + 4 \end{cases}$

Maximize or minimize each objective function.

12. Maximize $P = -21x + 11y$ for the constraints from Exercise 9.

13. Minimize $P = -2x - 4y$ for the constraints from Exercise 10.

14. Maximize $P = x + 3y$ for the constraints from Exercise 11.