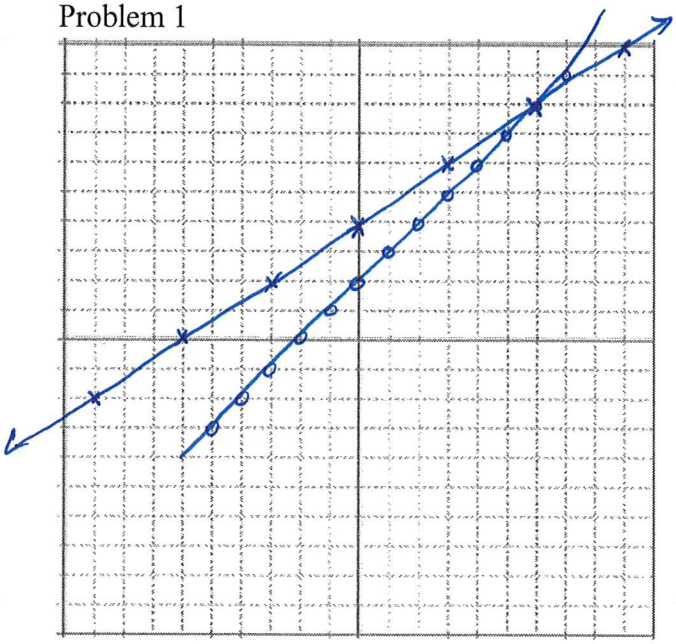
Graph each equation to find the point of intersection.

Test Name_____

*Remember to find a **nice starting point**, then use **the slope** to find other nice points.*

Problem 1

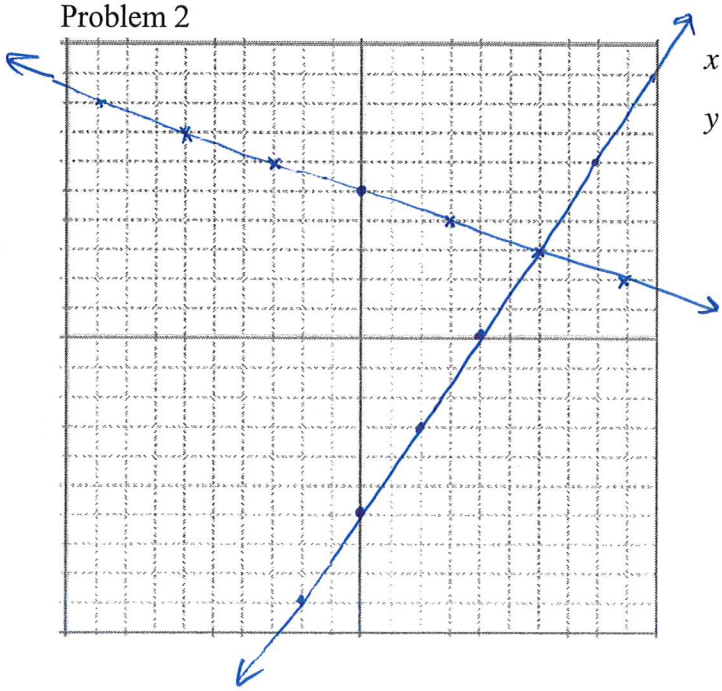


$y = \frac{2}{3}x + 4$ → m = 2/3 (0,4)

$x - y = -2$ → m = 1/1 (0,2)

Pt of Intersection (6,8)

Problem 2



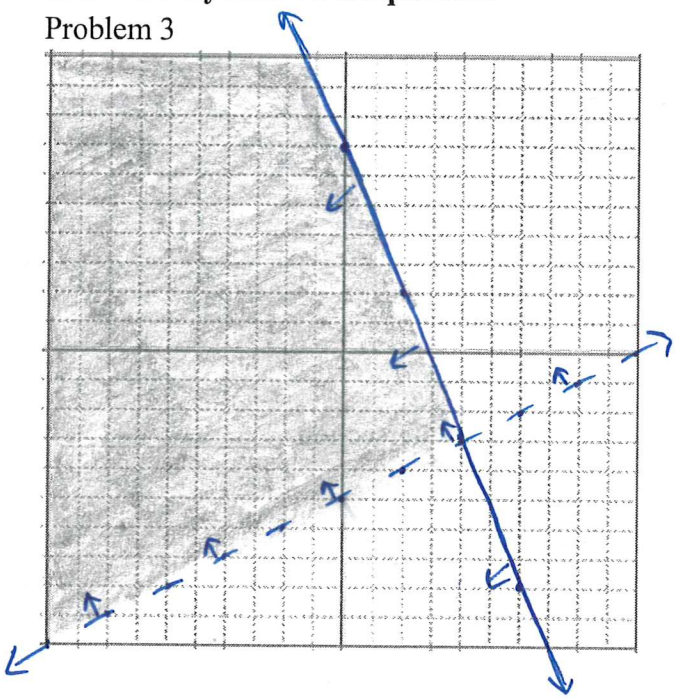
$x + 3y = 15$ → m = -1/3 (0,5)

$y = \frac{3}{2}x - 6$ → m = 3/2 (0,-6)

Pt of Intersection (6,3)

Solve the System of Inequalities

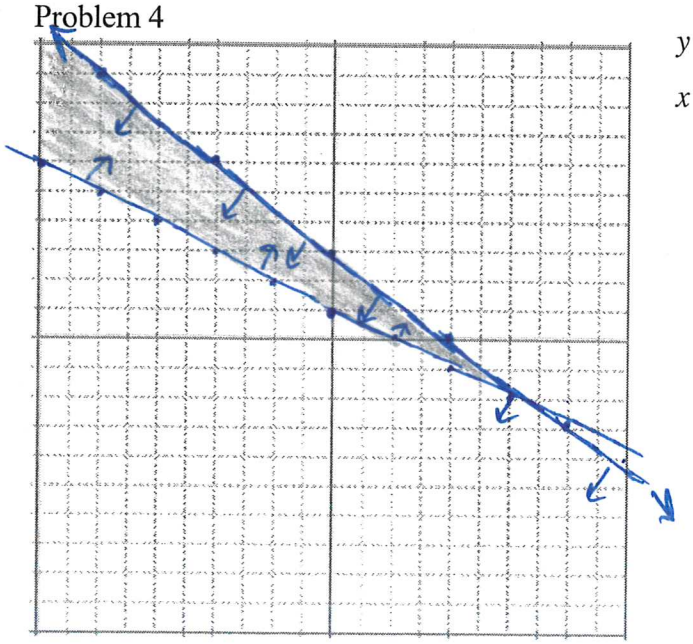
Problem 3



$y > \frac{1}{2}x - 5$ → m = 1/2 (0, -5)

$5x + 2y \leq 14$ → m = -5/2 (0, 7)

Problem 4



$y \leq \frac{-3}{4}x + 3$ → m = -3/4 (0, 3)

$x + 2y \geq 2$ → m = -1/2 (0, 1)

Solve each system of equations using **substitution. Show your work!**

Problem 5

$2x - 3y = -7$

$x + 3y = 10$ $\quad x = -3y + 10$

Pt of Intersection $(1, 3)$

$2[-3y + 10] - 3y = -7$

$-6y + 20 - 3y = -7$

$-9y = -27$

$y = 3$

$x = -3[3] + 10$

$= -9 + 10$

$= 1$

Problem 6

$x - 3y = 14$ $\quad x = 3y + 14$

$3x + 2y = -13$

Pt of Intersection $(-1, -5)$

$3[3y + 14] + 2y = -13$

$9y + 42 + 2y = -13$

$11y = -55$

$y = -5$

$x = 3[-5] + 14$

$x = -15 + 14$

$x = -1$

Problem 7

$5x + y = 4$ $\quad y = -5x + 4$

$x - 2y = 3$

Pt of Intersection $(1, -1)$

$x - 2[-5x + 4] = 3$

$x + 10x - 8 = 3$

$11x = 11$

$x = 1$

$y = -5[1] + 4$

$y = -1$

Solve each system of equations using **Linear Combination / Elimination. Show your work!**

Problem 8

$5x - y = -6$

$-1[x - y = -2]$

$5x - y = -6$

$-x + y = 2$

$4x = -4$

$x = -1$

$-1 - y = -2$

$-y = -2 + 1$

$-y = -1$

$y = 1$

Pt of Intersection $(-1, 1)$

Problem 9

$-2[x + 4y = 12]$

$2x - y = 15$

$-2x - 8y = -24$

$2x - y = 15$

$-9y = -9$

$y = 1$

$2x - 1 = 15$

$2x = 16$

$x = 8$

Pt of Intersection $(8, 1)$

Problem 10

$x - y = 9$

$5x + y = 33$

$6x = 42$

$x = 7$

$7 - y = 9$

$-y = 9 - 7$

$-y = 2$

$y = -2$

Pt of Intersection $(7, -2)$

Problem 11

$2[x - 3y = 14]$

$3[3x + 2y = -2]$

$2x - 6y = 28$

$9x + 6y = -6$

$11x = 22$

$x = 2$

$2 - 3y = 14$

$-3y = 14 - 2$

$\frac{-3y}{-3} = \frac{12}{-3}$

$y = -4$

Pt of Intersection $(2, -4)$

Solve each system of equations using **Cramer's Rule. Show your work!**

Problem 12 (make sure the equations are in standard form)

$y = -x - 5$

$2x - y = -13$

Pt of Intersection $(-6, 1)$

$x + y = -5$

$2x - y = -13$

$$x = \frac{\begin{vmatrix} C & Y \\ -5 & 1 \\ -13 & -1 \end{vmatrix}}{\begin{vmatrix} X & Y \\ 1 & 1 \\ 2 & -1 \end{vmatrix}} = \frac{5 - (-13)}{-1 - 2} = \frac{18}{-3}$$

$x = -6$

$-6 + y = -5$

$y = 1$

Problem 13

$x - y = 7$

$2x + 3y = -1$

Pt of Intersection $(4, -3)$

$$x = \frac{\begin{vmatrix} C & Y \\ 7 & -1 \\ -1 & 3 \end{vmatrix}}{\begin{vmatrix} X & Y \\ 1 & -1 \\ 2 & 3 \end{vmatrix}} = \frac{21 - 1}{3 - (-2)} = \frac{20}{5}$$

$x = 4$

$4 - y = 7$

$-y = 3$

$y = -3$

Problem 14 (make sure the equations are in standard form)

$y = x - 13$

$2x - 5y = 5$

Pt of Intersection $(20, 7)$

$-x + y = -13$

$2x - 5y = 5$

$$x = \frac{\begin{vmatrix} C & Y \\ -13 & 1 \\ 5 & -5 \end{vmatrix}}{\begin{vmatrix} X & Y \\ -1 & 1 \\ 2 & -5 \end{vmatrix}} = \frac{65 - 5}{+5 - 2} = \frac{60}{3}$$

$x = 20$

$-20 + y = -13$

$y = -13 + 20$

$y = 7$

Problem 15

$2x + 3y = 8$

$3x + y = 5$

Pt of Intersection $(1, 2)$

$$x = \frac{\begin{vmatrix} C & Y \\ 8 & 3 \\ 5 & 1 \end{vmatrix}}{\begin{vmatrix} X & Y \\ 2 & 3 \\ 3 & 1 \end{vmatrix}} = \frac{8 - 15}{2 - 9} = \frac{-7}{-7}$$

$x = 1$

$2 + 3y = 8$

$+3y = 6$

$y = +2$

Solve each system with the **method of your choosing**.

Problem 16

$2x + 3y = 6$

$x + 2y = 1$

$x = -2y + 1$

$2[-2y + 1] + 3y = 6$

$-4y + 2 + 3y = 6$

$-y = 4$

$y = -4$

$x = -2[-4] + 1$

$x = 8 + 1$

$x = 9$

Pt of Intersection $(9, -4)$

Problem 17

$y = 2x - 6$

$x + 2y = 13$

$x + 2[2x - 6] = 13$

$x + 4x - 12 = 13$

$5x = 25$

$x = 5$

$y = 2[5] - 6$

$y = 10 - 6$

$y = 4$

Pt of Intersection $(5, 4)$

Problem 18

$2[2x - 3y = -11]$

$3[5x + 2y = 1]$

$4x - 6y = -22$

$15x + 6y = 3$

$19x = -19$

$x = -1$

$-2 - 3y = -11$

$-3y = -9$

$y = 3$

Pt of Intersection $(-1, 3)$

Problem 19

$4x + 2y = 2$

$-2[3x + y = -2]$

$4x + 2y = 2$

$-6x - 2y = 4$

$-2x = 6$

$x = -3$

$-12 + 2y = 2$

$2y = 14$

$y = 7$

Pt of Intersection $(-3, 7)$

Problem 20

$3x + 8y = 13$

$-2[x + 4y = 5]$

$3x + 8y = 13$

$-2x - 8y = -10$

$x = 3$

$3 + 4y = 5$

$4y = 2$

$y = 1/2$

Pt of Intersection $(3, 1/2)$