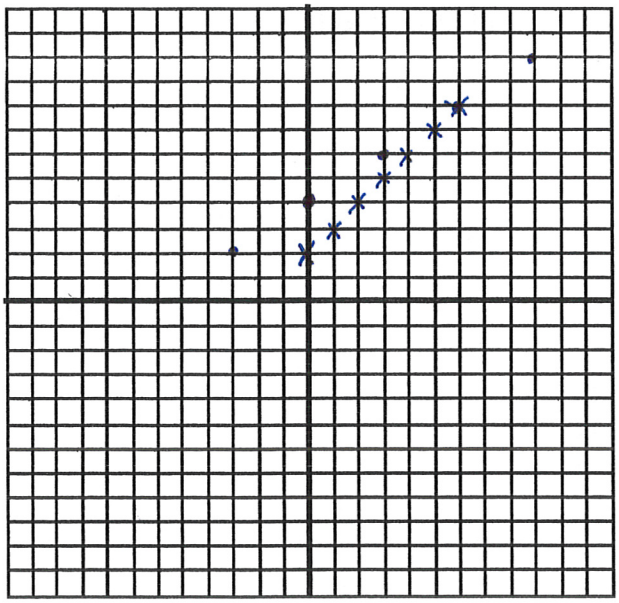
Graph each equation to find the point of intersection. Name_____

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

Problem 1

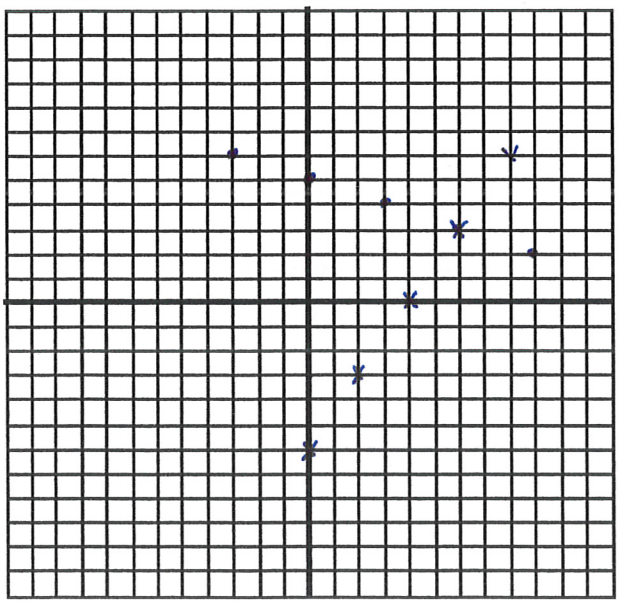


$y = \frac{2}{3}x + 4$ → m = 2/3 (0, 4)

$x - y = -2$ → 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 each system of equations using **substitution.** **(Do Any Two)**

Problem 3

e_1: $2x - 3y = -7$

e_2: $x + 3y = 10$

Pt of Intersection $(1, 3)$

e_2: $x = 10 - 3y$

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

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

$-9y = -27$

$y = 3$

$x = 10 - 3(3)$

$x = 10 - 9$

$x = 1$

Problem 4

e_1: $x - 3y = 14$

$3x + 2y = -13$

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

e_1: $x = 14 + 3y$

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

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

$11y = -55$

$y = -5$

$x = 14 + 3(-5)$

$x = 14 - 15$

$x = -1$

Problem 5

e_1: $5x + y = 4$

$x - 2y = 3$

Pt of Intersection $(1, -1)$

e_1: $y = 4 - 5x$

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

$x - 8 + 10x = 3$

$11x = 3 + 8$

$11x = 11$

$x = 1$

$y = 4 - 5(1)$

$= 4 - 5$

$= -1$

Solve each system of equations using **Linear Combination / Elimination. (Do any Two)**

Problem 6

e_1: $5x - y = -6$

e_2: $x - y = -2$

Pt of Intersection $(-1, 1)$

e_1: $5x - y = -6$

$-1[e_2]$: $-x + y = 2$

$4x = -4$

$\frac{4x}{4} = \frac{-4}{4}$

$x = -1$

$-1 - y = -2$

$-y = -2 + 1$

$-y = -1$

$y = 1$

Problem 7

e_1: $x + 4y = 12$

e_2: $2x - y = 15$

Pt of Intersection $(8, 1)$

$-2e_1$: $-2x - 8y = -24$

e_2: $2x - y = 15$

$-9y = -9$

$y = 1$

$2x - 1 = 15$

$2x = 15 + 1$

$\frac{2x}{2} = \frac{16}{2}$

$x = 8$

Problem 8

$x - y = 9$

$5x + y = 33$

Pt of Intersection $(7, -2)$

$6x = 42$

$x = 7$

$7 - y = 9$

$-y = 9 - 7$

$-y = 2$

$y = -2$

Solve each system of equations using **Cramer's Rule. (Do Any Two)**

Problem 9
$2x + 3y = 8$
$3x + y = 5$

Pt of Intersection $(1, 2)$

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

$3 + y = 5$
$y = 5 - 3$
$y = 2$

Problem 10
$2x + 3y = 6$
$x + 2y = 1$

Pt of Intersection $(9, -4)$

$$x = \frac{\begin{vmatrix} C & Y \\ 6 & 3 \\ 1 & 2 \end{vmatrix}}{\begin{vmatrix} X & Y \\ 2 & 3 \\ 1 & 2 \end{vmatrix}} = \frac{12-3}{4-3} = \frac{9}{1} = 9$$

$9 + 2y = 1$
$2y = 1 - 9$
$2y = -8$
$y = -4$

Problem 11
$2x - 3y = -11$
$5x + 2y = 1$

Pt of Intersection $(-1, 3)$

$$x = \frac{\begin{vmatrix} C & Y \\ -11 & -3 \\ 1 & 2 \end{vmatrix}}{\begin{vmatrix} X & Y \\ 2 & -3 \\ 5 & 2 \end{vmatrix}} = \frac{-22 - -3}{4 - (-15)} = \frac{-19}{19} = -1$$

$-2 - 3y = -11$
$-3y = -11 + 2$
$-3y = -9$
$y = 3$

Solve each system with the **method of your choosing. (Do any Two)**

Problem 12

$y = 2x - 6$

$x + 2y = 13$

Pt of Intersection $(5, 4)$

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

$x + 4x - 12 = 13$

$5x = 13 + 12$

$\frac{5x}{5} = \frac{25}{5}$

$x = 5$

$y = 2(5) - 6$

$y = 10 - 6$

$y = 4$

Problem 13

e_1: $4x + 2y = 2$

e_2: $3x + y = -2$

Pt of Intersection $(-3, 7)$

e_1: $4x + 2y = 2$

$-2e_2$: $-6x - 2y = 4$

$-2x = 6$

$x = -3$

$-9 + y = -2$

$y = -2 + 9$

$y = 7$

Problem 14

$3x + 8y = 4$

$2x - y = 12$

Pt of Intersection $(5\frac{5}{19}, -1\frac{9}{19})$

$2x - 12 = y$

$3x + 8[2x - 12] = 4$

$3x + 16x - 96 = 4$

$19x = 4 + 96$

$19x = 100$

$x = 5\frac{5}{19}$

$2[5\frac{5}{19}] - 12 = y$

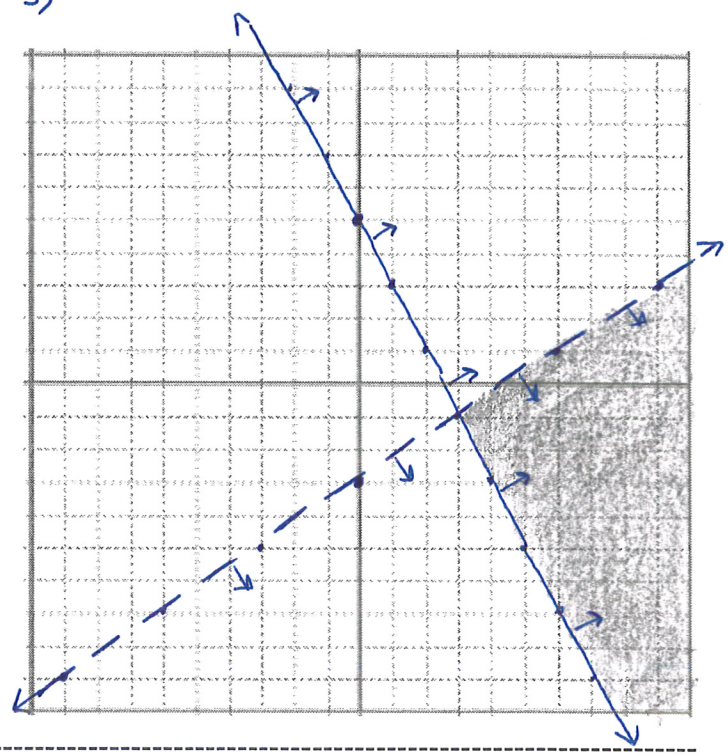
$-1\frac{9}{19} = y$

$\frac{100}{19}, \frac{-28}{19}$

Graph the **System of Inequalities. (Do Both)**

#15. $2x + y \geq 5$ → $m = \frac{-2}{1}$ $(0, 5)$

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



#16. $y \leq -\frac{1}{2}x + 1$ → $m = -\frac{1}{2}$ $(0, 1)$

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