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Anna in Bb...??

MATH 339
Fall 2025
2D Linear Systems

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Instructions:

- i. Solve each system using either substitution or elimination.
 - ii. Use Desmos to graph each system.
 - iii. Based on your graph, confirm your algebraic solution and describe the solution set **geometrically** (e.g., one point of intersection, no intersection, same line).
1. (5 points) Solve the system:

$$\begin{cases} 2x + y = 5 \\ x - y = 1 \end{cases}$$

$$\begin{aligned} x &= y + 1 & 2(1+y) + y &= 5 \\ x &= y + 1 & 2 + 2y + y &= 5 \\ x &= 2 & 2 + 3y &= 5 \\ && 3y &= 5 - 2 \\ && 3y &= 3 \\ && y &= 1 \end{aligned}$$

(2, 1)

→ one point of intersection

2. (5 points) Solve the system:

$$\begin{cases} 2x + y = 5 \\ -6x - 3y = -3 \end{cases}$$

$$y = 5 - 2x$$

$$-6x - 3(5 - 2x) = -3$$

$$-6x - 15 + 6x = -3$$

$$0x - 15 = -3 \quad -15 = -3$$

→ no solution

(no intersection)

3. (5 points) Solve the system:

$$\begin{cases} x - 2y = 4 \\ 2x - 4y = 8 \end{cases}$$

$$\frac{2x}{2} - \frac{4y}{2} = \frac{8}{2} \rightarrow x - 2y = 4 \quad x - 2y = 4$$

→ infinitely many soln
(same line)