

(17)

Systems of Equations - Graphing

- Systems of equations is where two or more equations that may share a common point (or many points) (or no points)

Steps to Graph Systems:

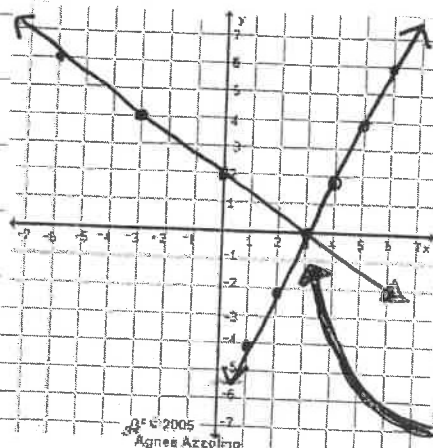
- ① Make sure all equations are in slope-intercept form.
- ② Graph each equation.
- ③ Identify the solution. $(y=mx+b)$

3 Types of Solutions:

- ① One solution (x,y) Lines that intersect
- ② No Solutions $(\emptyset)$ parallel lines never intersect (same slope)
- ③ Infinitely Many Solutions (IMS) Lines coincide with each other (meaning identical)

Ex 1)

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



Solution: $(3, 0)$

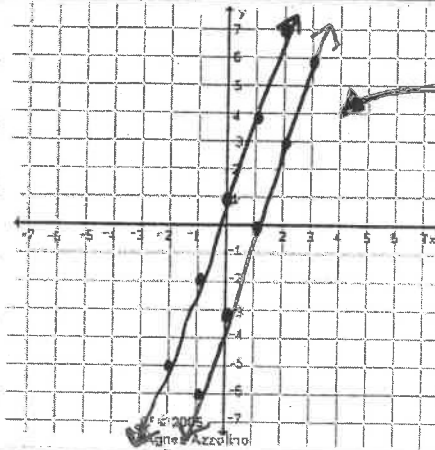
Ex 2)

$$\begin{aligned} \text{S } y-1 &= 3x \\ \checkmark \text{C } y &= \underline{3x-3} \end{aligned}$$

$$\begin{array}{r} y-1 = 3x \\ \times 1 \quad +1 \\ \hline \end{array}$$

* Same slopes

$$\checkmark y = \underline{3x+1}$$



Never intersect

Solution: $\emptyset$

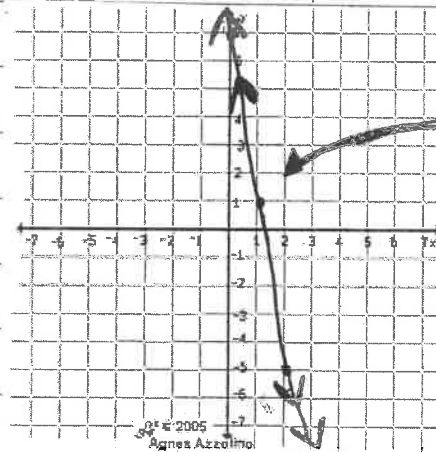
Ex 3)

$$\begin{aligned} \checkmark \text{S } y &= -6x + 7 \\ \text{C } 12x + 2y &= 14 \\ -12x & \quad -12x \end{aligned}$$

$$\begin{array}{r} 2y = -12x + 14 \\ \underline{2} \quad \underline{2} \quad \underline{2} \end{array}$$

$$\checkmark y = -6x + 7$$

Coinciding (identical) lines



Share every point

Solution: IMS