

OCT 22/07

SYSTEMS OF EQUATIONS

TYPE I - INDEPENDENT

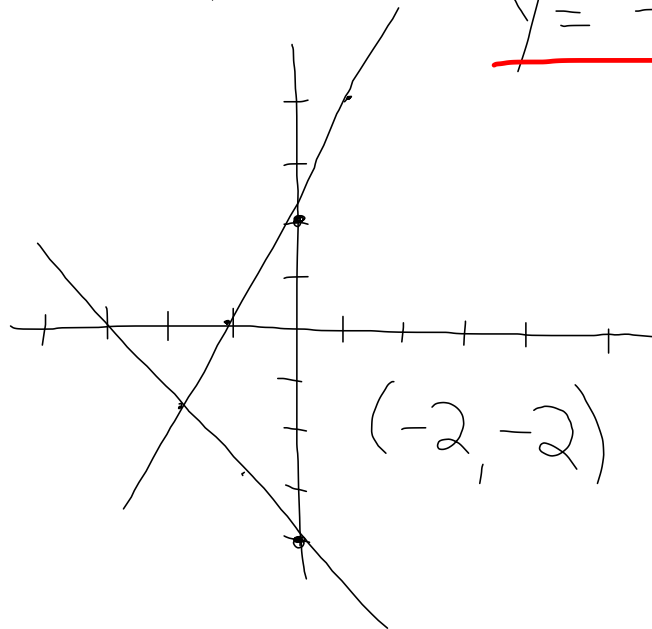
$$2x - y = -2$$

$$x + y = -4$$

$$-y = -2x - 2$$

$$\underline{y = 2x + 2}$$

$$\underline{y = -x - 4}$$



TYPE II - DEPENDENT

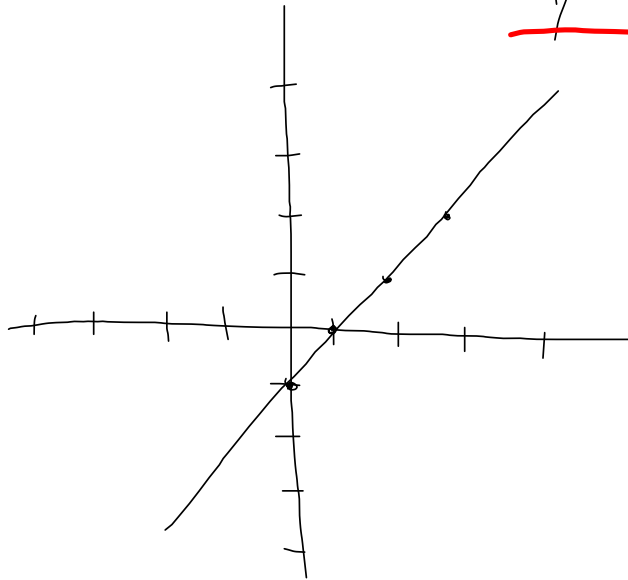
$$x - y = 1$$

$$\underline{y = x - 1}$$

$$3x - 3y = 3$$

$$\frac{-3y}{-3} = \frac{-3x + 3}{-3}$$

$$\underline{y = x - 1}$$



SAME SLOPE

SAME Y-INT

SAME LINE

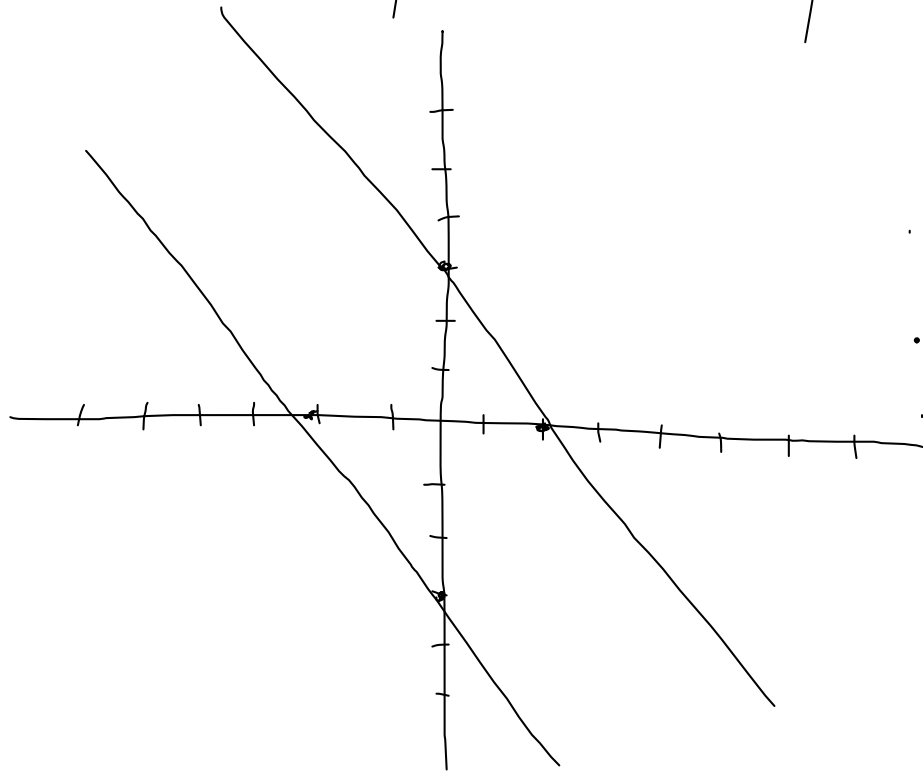
INFINITELY MANY

SOLUTIONS

TYPE III - INCONSISTENT

$$3x + 2y = 6 \quad y = -\frac{3}{2}x + 3$$

$$3x + 2y = -6 \quad y = -\frac{3}{2}x - 3$$



- SAME SLOPE
- DIFFERENT Y-INT
- PARALLEL
- NO SOLN.

SOLVING SYSTEMS OF EQUATIONS

SUBSTITUTION

$$4x + y = 1 \rightarrow y = 1 - 4x$$

$$2x - 3y = 4$$

$$2x - 3(1 - 4x) = 4$$

$$2x - 3 + 12x = 4$$

$$\frac{14x}{14} = \frac{7}{14}$$

$$x = \frac{1}{2}$$

$$4x + y = 1$$

$$4\left(\frac{1}{2}\right) + y = 1$$

$$2 + y = 1$$

$$y = -1$$

SOLN $\left(\frac{1}{2}, -1\right)$

INDEPENDENT

SOLVE BY SUBSTITUTION

$$\begin{aligned} 5x + 4y &= 6 & x &= \frac{6-4y}{5} \\ -2x - 3y &= -1 \end{aligned}$$

$$-2 \left(\frac{6-4y}{5} \right) - 3y = -1$$

$$-2(6-4y) - 15y = -5$$

$$-12 + 8y - 15y = -5$$

$$\frac{-7y}{-7} = \frac{7}{-7}$$

$$y = -1$$

$$5x + 4y = 6$$

$$5x + 4(-1) = 6$$

$$5x - 4 = 6$$

$$5x = 10$$

$$x = 2$$

SOLN

(2, -1)

ADDITION - SUBTRACTION METHOD

$$\begin{aligned} 5x + 4y = 6 &\rightarrow 5x + 4y = 6 \quad \times 2 \\ -3y - 2x = -1 &\rightarrow -2x - 3y = -1 \quad \times 5 \end{aligned}$$

$$\begin{array}{r} 10x + 8y = 12 \\ + \quad -10x - 15y = -5 \\ \hline \end{array}$$

$$5x + 4y = 6$$

$$5x + 4(-1) = 6$$

$$5x - 4 = 6$$

$$5x = 10$$

$$x = 2$$

$$\begin{array}{r} -7y = 7 \\ \hline -7 \quad -7 \end{array}$$

$$y = -1$$

$$\text{SOLN } (2, -1)$$

SOLVE

$$x - 2y = 3$$

$$-2x + 4y = 1$$

$$2x - 4y = 6$$

$$+ \quad -2x + 4y = 1$$

$$0 \neq 7$$

NO SOLN - INCONSISTENT

Ex 24 Q[#] 1-7, 9, 11-15