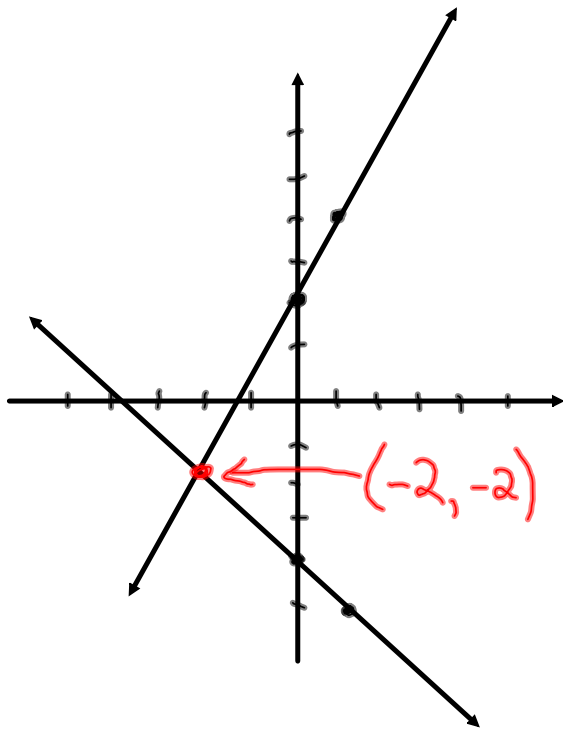


MAR 25/09

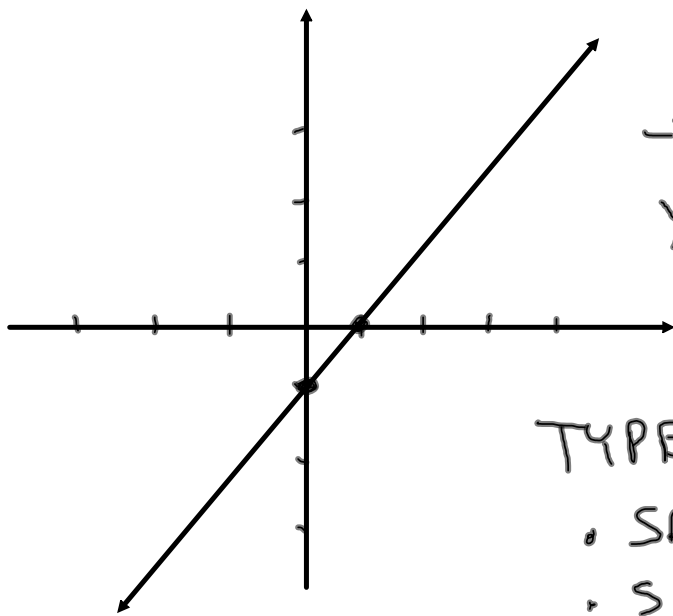
SYSTEMS OF EQUATIONS



$$\begin{array}{l} 2x - y = -2 \\ -y = -2x - 2 \\ y = 2x + 2 \end{array} \quad \begin{array}{l} x + y = -4 \\ y = -x - 4 \end{array}$$

TYPE 1 - INDEPENDENT

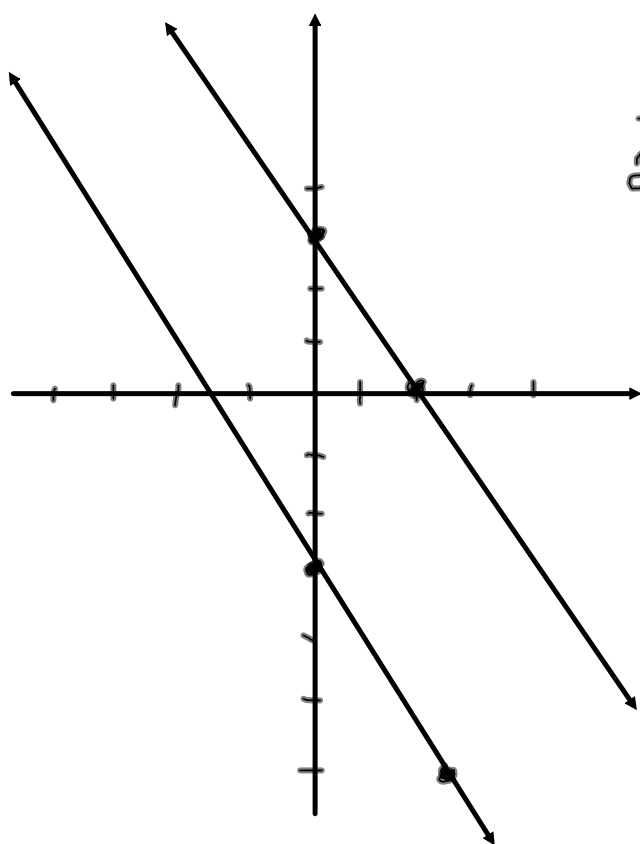
- DIFFERENT SLOPES
- DIFFERENT INT
- THEY HAVE 1 SOLUTION



$$\begin{array}{ll} x - y = 1 & 3x - 3y = 3 \\ -y = -x + 1 & -3y = -3x + 3 \\ y = x - 1 & y = x - 1 \end{array}$$

TYPE II - DEPENDENT

- SAME SLOPE
- SAME Y-INT
- INFINITE NUMBER OF SOLUTIONS



$$\begin{array}{ll}
 3x + 2y = 6 & 3x + 2y = -6 \\
 2y = -3x + 6 & 2y = -3x - 6 \\
 y = -\frac{3}{2}x + 3 & y = -\frac{3}{2}x - 3
 \end{array}$$

TYPE III - INCONSISTENT

- SAME SLOPE
- DIFFERENT Y-INT
- NO SOLUTION

SOLVING SYSTEMS OF EQUATIONS

SUBSTITUTION

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

$$2x - 3y = 4$$

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

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

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

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

$$4x + y = 1$$

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

$$2 + y = 1$$

$$y = -1$$

SOLN

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

SOLVE BY SUBSTITUTION

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

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

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

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

$$-7y = 7$$

$$y = -1$$

$$5x + 4y = 6$$

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

$$5x = 10$$

$$x = 2$$

SOLN

$$(2, -1)$$

ADDITION SUBTRACTION METHOD

$$\begin{array}{r} 5x + 4y = 6 \\ -3x - 2y = -1 \end{array} \xrightarrow{+} \begin{array}{r} 5x + 4y = 6 \\ -6x - 4y = -2 \\ \hline \end{array}$$

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

$$12 - 2y = -1$$

$$\begin{array}{r} -2y = -13 \\ \hline -2 \quad -2 \end{array}$$

$$y = \frac{13}{2} \text{ or } 6\frac{1}{2} \text{ or } 6.5$$

$$\begin{array}{r} x = 4 \\ \hline -x = -1 \end{array}$$

$$x = -4$$

$$\text{SOLN} \left(-4, \frac{13}{2} \right)$$

SOLVE

$$\begin{array}{rcl} x - 2y = 3 & \xrightarrow{\times 2} & 2x - 4y = 6 \\ -2x + 4y = 1 & & \\ \hline & & 0 \neq 7 \end{array}$$

INCONSISTENT
NO SOLUTION

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