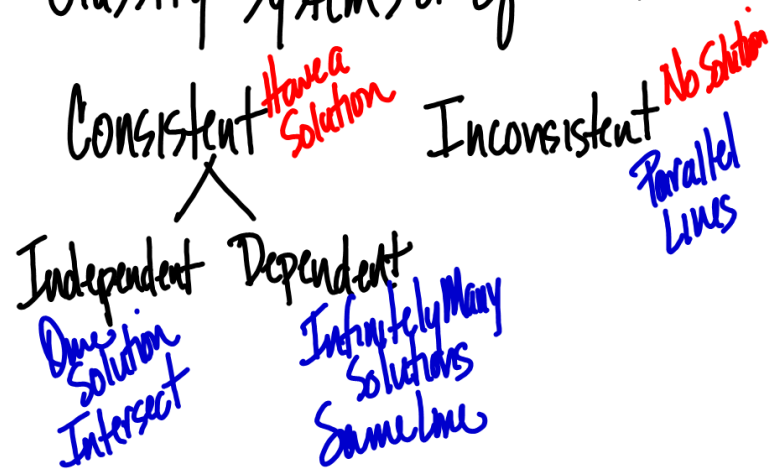


Ch 3 Classify Systems of Equations



Graph

$$2x + 3y = 18$$

$$3y = -2x + 18$$

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

$$5x - y = 11$$

$$-y = -5x + 11$$

2nd Calc Intersect

$$y = 5x - 11$$

(3, 4)

Substitution

$$2x + 3y = 18$$

$$5x - y = 11$$

$$\overset{-5x}{5x} - y = 11 \overset{-5x}{-5x}$$

$$\frac{-y}{-1} = \frac{5x+11}{-1}$$

$$y = 5x - 11$$

Solve 1 equation
1 of the
variablesSubstitute
into other
equation

$$2x + 3y = 18$$

$$2x + 3(5x - 11) = 18$$

$$2x + 15x - 33 = 18$$

$$\frac{17x}{17} = \frac{51}{17}$$

$$x = 3$$

$$y = 5x - 11$$

$$y = 5(3) - 11$$

$$y = 15 - 11$$

$$y = 4 \quad (3, 4)$$

Solve

Substitute
to find y

Elimination

$$\begin{array}{l} 2x + 3y = 18 \\ 3 \cdot 5x - y = 11 \end{array}$$

$$\begin{array}{r} 2x + 3y = 18 \\ + 15x - 3y = 33 \\ \hline \end{array}$$

$$\begin{array}{r} 17x = 51 \\ \hline 17 \quad 17 \end{array}$$

$$x = 3$$

$$5x - y = 11$$

$$5(3) - y = 11$$

$$\begin{array}{r} 15 - y = 11 - 5 \\ -y = -4 \\ \hline -1 \quad -1 \end{array}$$

$$y = 4$$

Substitute to
find yAdd
coefficients of 1
variable to be
oppositesSubtract
coefficients of 1
variable same

(3, 4)

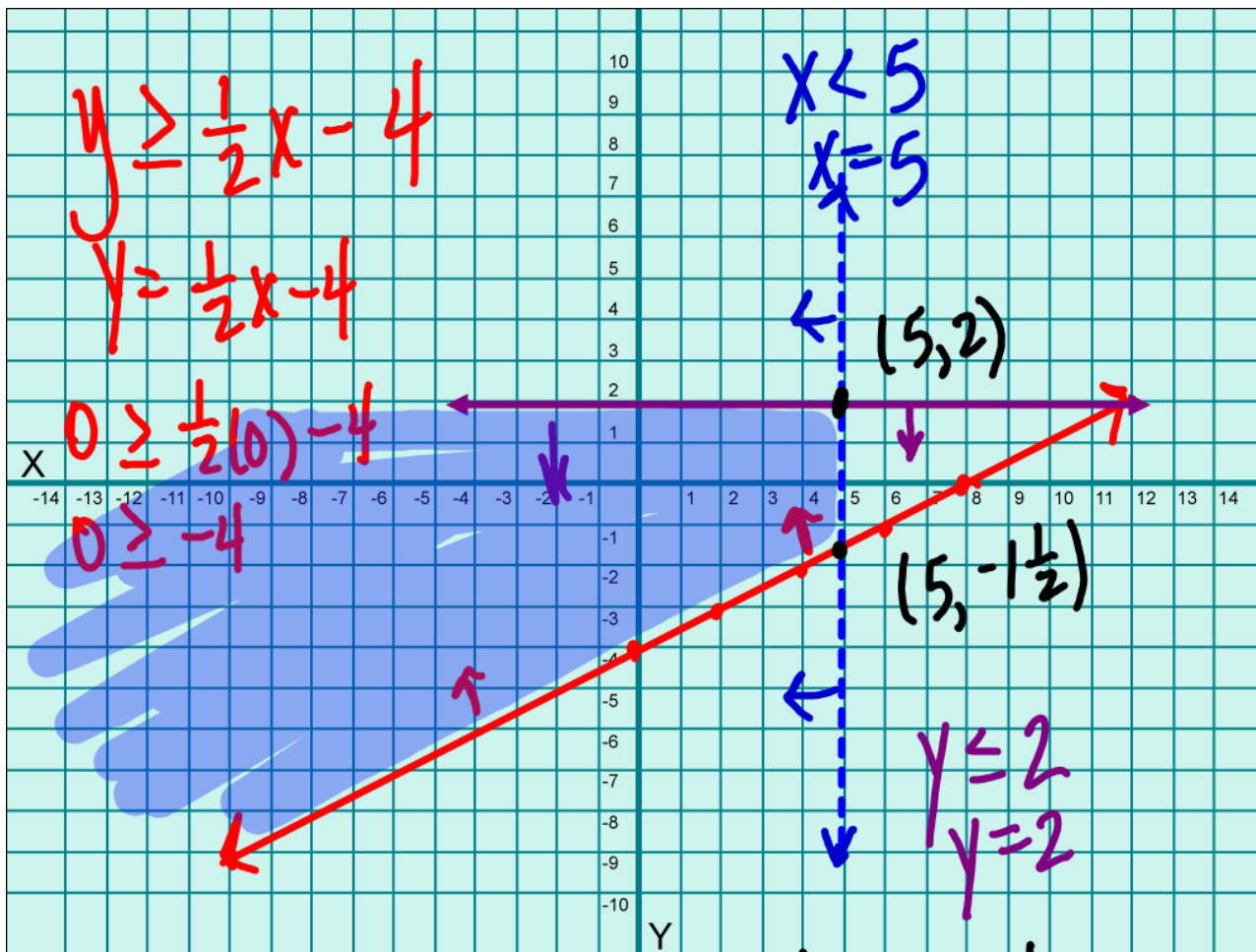
All variables
zero out

$$0 = 0$$

Infinitely many
solutions

$$0 \neq 5$$

No solution



Substitute into Objective
function

$$E = 2x + y$$

$$(5, 2)$$

$$E = 2(5) + 2 = 12$$

$$(5, -\frac{1}{2})$$

$$E = 2(5) - \frac{1}{2} = 9\frac{1}{2}$$