

7.1-7.2 Study Guide

Solve a System of Equations by Graphing or Substitution

7.1: Solve Systems of Equations by Graphing:

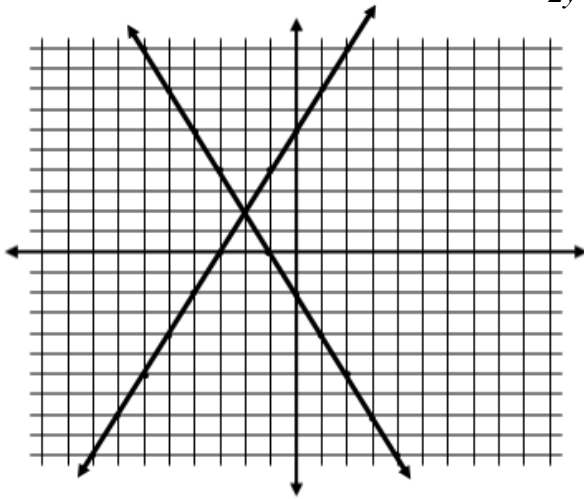
- Be able to identify an ordered pair as a solution to a system

Ex: Is (5, 2) a solution to the system: $2x - 3y = 4$
 $2x + 8y = 11$

No because if you plug in the ordered pair into **both** equations, it does not work.

- Be able to solve a system of equations by graphing

Ex: Solve the system by graphing: $6x + 3y = -6$
 $2y - 4x = 12$



Solution: (-2, 2)

7.2: Solve Systems of Equations by Substitution:

- Be able to solve a system of equations by substitution

Ex: $y = x - 2$
 $x = 17 - 4y$

Ex: $5x + 2y = 9$
 $x + y = -3$
 $\frac{-x}{-x} \quad \frac{-x}{-x}$
 $y = -3 - x$

$$\begin{aligned} x &= 17 - 4(x - 2) \\ x &= 17 - 4x + 8 \\ +4x &\quad +4x \\ \hline 5x &= 25 \\ 5 &\quad 5 \\ \hline x &= 5 \end{aligned}$$

$$\begin{aligned} y &= x - 2 \\ y &= 5 - 2 \\ y &= 3 \end{aligned}$$

(5, 3)

$$\begin{aligned} 5x + 2(-3 - x) &= 9 \\ 5x + -6 - 2x &= 9 \\ 3x - 6 &= 9 \\ +6 &\quad +6 \\ \hline 3x &= 15 \\ \hline x &= 5 \end{aligned}$$

$$\begin{aligned} y &= -3 - x \\ y &= -3 - 5 \\ y &= -8 \end{aligned}$$

(5, -8)

Ex: $y = x - 4$
 $y = 18 + 2x$

$$\begin{array}{r}
 x - 4 = 18 + 2x \\
 \underline{-x \quad \quad -x} \\
 -4 = 18 + x \\
 \underline{-18 \quad -18} \\
 -22 = x \\
 y = x - 4 \\
 y = -22 - 4 \\
 y = -26 \qquad \qquad \qquad (-22, -26)
 \end{array}$$

- Be able to write a linear system and solve

Ex: John and David went to the store to buy notebooks and markers. John bought one notebook and two boxes of markers and spent \$11. David bought three notebooks and five boxes of markers and spent \$29.

- a) Identify two variables to represent what you do not know.

x : Cost of a notebook
 y : Cost of a box of markers

- b) Write a system of equations to represent the situation.

$$\begin{array}{l}
 x + 2y = 11 \\
 3x + 5y = 29
 \end{array}$$

- c) Solve the system to find the cost of a notebook. Find the cost of a box of markers.

Isolate x from the first equation: $x = 11 - 2y$
 Plug into the second equation; $3(11 - 2y) + 5y = 29$
 Solve for x .

$$\begin{array}{r}
 33 - 6y + 5y = 29 \\
 33 - 1y = 29 \\
 \underline{-33 \quad -33} \\
 -1y = -4 \\
 \underline{-1 \quad -1} \\
 y = 4
 \end{array}$$

$$\begin{array}{l}
 x = 11 - 2y \\
 x = 11 - 2(4) \\
 x = 11 - 8 \\
 x = 3 \qquad \qquad \qquad \text{NBs: \$3, Markers \$4}
 \end{array}$$

- d) Find the total cost if someone wanted to buy three notebooks and two boxes of markers.

$$3(3) + 2(4) = 9 + 8 = \$17$$