

Systems of Equations-Word Problems Worksheet #2

1. At Chipotle, one customer pays \$16 for 2 chicken burritos and 2 sides of chips & salsa. Another customer pays \$30 for 4 chicken burritos and 3 sides of chips & salsa. How much does each chicken burrito and side of chips and salsa cost?

a) Define your variables then write a linear system of equations to represent the cost of each customer's order.

$x = \text{Chicken burrito}$
 $y = \text{Chips \& Salsa}$

$$\begin{aligned} 2x + 2y &= 16 \\ 4x + 3y &= 30 \end{aligned}$$

b) Solve by Graphing.



put into Slope intercept form

$$\begin{aligned} 2x + 2y &= 16 \\ -2x & \quad -2x \\ \hline 2y &= -2x + 16 \\ \frac{2y}{2} &= \frac{-2x}{2} + \frac{16}{2} \\ y &= -x + 8 \end{aligned}$$

$$\begin{aligned} 4x + 3y &= 30 \\ -4x & \quad -4x \\ \hline 3y &= -4x + 30 \\ \frac{3y}{3} &= \frac{-4x}{3} + \frac{30}{3} \\ y &= -\frac{4}{3}x + 10 \end{aligned}$$

(6, 2) point of intersection
 \$6 for a chicken burrito
 \$2 for Chips & Salsa

c) Solve using Elimination Substitution.

$$\begin{aligned} -2(2x + 2y = 16) & \Rightarrow -4x - 4y = -32 \\ 4x + 3y = 30 & \\ \hline -y &= -2 \\ y &= 2 \end{aligned}$$

$$\begin{aligned} 2x + 2y &= 16 \\ 2x + 2(2) &= 16 \\ 2x + 4 &= 16 \\ -4 & \quad -4 \\ \hline 2x &= 12 \\ x &= 6 \end{aligned}$$

d) Solve using Substitution Elimination.

$$\begin{aligned} 2x + 2y &= 16 \\ -2y & \quad -2y \\ \hline 2x &= -2y + 16 \\ \frac{2x}{2} &= \frac{-2y}{2} + \frac{16}{2} \\ x &= -y + 8 \end{aligned}$$

$$\begin{aligned} 4(-y + 8) + 3y &= 30 \\ -4y + 32 + 3y &= 30 \\ -y + 32 &= 30 \\ -32 & \quad -32 \\ \hline -y &= -2 \\ y &= 2 \end{aligned}$$

$$\begin{aligned} x &= -y + 8 \\ x &= -(2) + 8 \\ x &= 6 \end{aligned}$$

e) Check your final solution algebraically.

Eg 1: $2(6) + 2(2) = 16$
 $12 + 4 = 16$
 $16 = 16$

Eg 2: $4(6) + 3(2) = 30$
 $24 + 6 = 30$
 $30 = 30$