

# Unit 5 Day 17 Notes

## Systems of Linear Equations - Application Problems

EXAMPLE 1: You won a dinner with Carson Daly and the four judges on the Voice (How many total people are at dinner then??). Some of you order chicken for \$9 and some order steak for \$15. The total is \$78. How many chicken dinners were ordered?

DEFINE YOUR VARIABLES:

$x = \text{chicken}$   
 $y = \text{steak}$

CREATE YOUR SYSTEM:

$$\begin{aligned} 9x + 15y &= 78 \\ x + y &= 6 \end{aligned}$$

\*can solve by elimination or substitution

ANSWER THE QUESTION:

2 people ordered  
chicken  
4 people ordered  
steak

SOLVE:

$$\begin{aligned} 9x + 15y &= 78 \Rightarrow 9x + 15y = 78 \\ -9(x + y) &= -54 \Rightarrow \frac{-9x - 9y}{\hline} = -54 \\ x + 4 &= 6 & \quad \quad \quad 6y &= 24 \\ \boxed{x=2} & & \quad \quad \quad \boxed{y=4} & \end{aligned}$$

EXAMPLE 2: You sold two different types of cookie dough for your choral fundraiser. Sugar cookie dough sold for \$6 a package and deluxe triple chocolate chunk sold for \$8 a package. You collected a total of \$92 for the 14 packages. How many of each type of cookie dough did you sell?

DEFINE YOUR VARIABLES:

$x = \text{sugar cookies}$   
 $y = \text{triple choc. chunk}$

CREATE YOUR SYSTEM:

$$\begin{aligned} 6x + 8y &= 92 \\ x + y &= 14 \end{aligned}$$

ANSWER THE QUESTION:

I sold 10 packages  
of sugar cookies  
and 4 packages  
of triple chocolate  
chunk!

SOLVE:

$$\begin{aligned} 6x + 8y &= 92 \Rightarrow 6x + 8y = 92 \\ -6(x + y) &= -84 \Rightarrow \frac{-6x - 6y}{\hline} = -84 \\ x + 4 &= 14 & \quad \quad \quad 2y &= 8 \\ \boxed{x=10} & & \quad \quad \quad \boxed{y=4} & \end{aligned}$$

Directions: See if you and your partner can match the equations to the word problems. Do not solve 😊

<p>A.  <math>4x + 2y = 54</math>  <math>x + y = 17</math></p>	<p>B.  <math>5x + 6y = 100</math>  <math>x + y = 40</math></p>	<p>C.  <math>5x + 6y = 100</math>  <math>x + y = 17</math></p>	<p>D.  <math>x + y = 100</math>  <math>5x + 6y = 580</math></p>	<p>E.  <math>x + y = 16</math>  <math>5x + 25y = 100</math></p>
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1. Starb Uck's owns a coffee store and sells two types of coffee. Light roasted coffee sells for \$5 per kilogram and dark sells for \$6 per kilogram. In one day, the Starb sells 40 kilograms of coffee which makes him \$100. How many of each type of coffee did he sell?

Answer: B       $5x + 6y = 100$   
 $x + y = 40$



2. Holly Hinsdale spent \$100 on Red Devil merchandise. Plain shirts cost \$5 and fancy shirts cost \$6. She bought a total of 17 T-shirts! How many of each did she buy?

Answer: C       $5x + 6y = 100$   
 $x + y = 17$

3. There are 17 animals in Berenson's Barn. Some are chickens and some are pigs. There are 54 legs in all. How many of each animal is there?

Answer: A       $2x + 4y = 54$   
 $x + y = 17$



4. A class of 100 students went on a field trip. They took 16 vehicles, some cars and some buses. Find out how many of each they took if each car holds 5 students and each bus holds 25 students.

Answer: E       $5x + 25y = 100$   
 $x + y = 16$

5. Charlie's Cupcakes sells cheesecake and Oreo flavored cupcakes. On Monday, Charlie's sold 100 cheesecake and Oreo cupcakes. Cheesecake cupcakes sell for \$6 and Oreo cupcakes sell for \$5 each. If the bakery made \$580 just on cheesecake and Oreo, which flavor sold the most?

Answer: D       $6x + 5y = 580$   
 $x + y = 100$

