1. What value of **y** satisfies the following system of equations?

$y = -3x - 3$

$-2x + y = 2$

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

$-5x - 3 = 2$

$+3 \quad +3$

$-5x = 5$

$\frac{-5x}{-5} = \frac{5}{-5}$

$x = -1$

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

$y = 3 - 3$

$y = 0$

***Solve the system. Then use the y-value as your answer**

2. Solve: $2x - 3y = 12$

$x = 4y + 1$

$2(4y + 1) - 3y = 12$

$8y + 2 - 3y = 12$

$5y + 2 = 12$

$-2 \quad -2$

$\frac{5y}{5} = \frac{10}{5}$

$y = 2$

$x = 4(2) + 1$

$x = 9$

$(9, 2)$

SYSTEMS APPLICATION

Systems Word Problems

DEFINE VARIABLES! → SET UP EQUATIONS & SOLVE! → IDENTIFY THE ANSWER!

1. The sum of two numbers is 30 and their difference is 12. Find the two numbers.

x = 1st #

y = 2nd #

$x + y = 30$

$x - y = 12$

2. The sum of two numbers is 24 and their difference is 2. What are the numbers?

$x = 1^{st}$ #

$y = 2^{nd}$ #

$x + y = 24$

$x - y = 2$

3. The difference between two numbers is 9. The first number plus twice the other number is 27. Find the two numbers.

$x = 1^{st}\#$

$y = 2^{nd}\#$

$x - y = 9$

$x + 2y = 27$

4. The sum of two numbers is 36. Twice the first number minus the second is 6. Find the numbers.

$x = 1^{st}\#$

$y = 2^{nd}\#$

$x + y = 36$

$2x - y = 6$

5. The sum of two numbers is 20. The difference between three times the first number and twice the second is 40. Find the two numbers.

6. The sum of two numbers is 25. One number is twice the second number plus seven. What are the two numbers?

7. The cost of 3 boxes of envelopes and 4 boxes of notebook paper is $13.25. Two boxes of envelopes and 6 boxes of notebook paper cost $17. Find the cost of each.

x = cost of envelope box

y = cost of ntbk. paper box

$$3x + 4y = 13.25$$

$$2x + 6y = 17$$

8. The cost of 12 oranges and 7 apples is $5.36. Eight oranges and 5 apples cost $3.68. Find the cost of each.

$\square x + \square y = \square \quad \square x + \square y = \square$

X = cost per orange

y = cost per apple

$$12X + 7y = 5.36$$

$$8X + 5y = 3.68$$

9. Gabby and Sydney bought some pens and pencils. Gabby bought 4 pens and 5 pencils for $6.71. Sydney bought 5 pens and 3 pencils for $7.12. Find the cost of each.

$4x + 5y =$

$5x + 3y$

x = cost per pen

y = cost per pencil

$$4x + 5y = 6.71$$
$$5x + 3y = 7.12$$

10. At a sale on winter clothing, Cody bought two pairs of gloves and four hats for $43.00. Tori bought two pairs of gloves and two hats for $30.00. Find the cost of each.

x = \$ per gloves

y = \$ per hat

$$2x + 4y = 43.00$$
$$2x + 2y = 30.00$$

11. A garden supply store sells two types of lawn mowers. The smaller mower costs \$249.99 and the larger mower cost \$329.99. If 30 total mowers were sold and the total sales for a given year was \$8379.70, find how many of each type were sold.

x = # of small mowers

y = # of large mowers

$$x + y = 30$$

$$249.99x + 329.99y = 8379.70$$

12. The Town Recreation Department ordered a total of 100 baseballs and bats for the summer baseball camp. Baseballs cost $4.50 each and bats cost $20 each. The total purchase was $822. How many of each item was ordered?

X = # of baseballs
y = # of bats

$x + y = 100$

$4.50x + 20y = 822$

13. A group of 40 children attended a baseball game on a field trip. Each child received either a hot dog or bag of popcorn. Hot dogs were $2.25 and popcorn was $1.75. If the total bill was $83.50, how many hotdogs and bags of popcorn were purchased?

14. One night a theater sold 548 movie tickets. An adult's ticket costs $6.50 and a child's ticket cost $3.50. In all, $2881 was taken in. How many of each kind of ticket were sold?

x = # of adult tickets

y = # of child tickets

$$x + y = 548$$

$$6.50x + 3.50y = 2881$$

15. Adult tickets for the school musical sold for $3.50 and student tickets sold for $2.50. On a given night, 321 tickets were sold for $937.50. How many of each kind of ticket were sold?

16. A collection of dimes and nickels is worth \$3.30. If there are 42 coins in all, how many of each kind of coin are there?

17. Mary has a collection of nickels and quarters for a total value of $4.90. If she has 42 coins total, how many of each kind are there?