Warm Up **11/30/18**

1. Solve: $-2(3x + 4y = 24)$

$6x + 8y = 24$

$-6x - 8y = -48$

$+ \quad 6x + 8y = 24$

$0 = -24$

$\emptyset$

2. Solve: $-4x + 5 > 29$

$-5 \quad -5$

$\frac{-4x}{-4} > \frac{24}{-4}$

$x < -6$

3. Solve for y. $3x - 2y < -26$

$-3x \quad -3x$

$\frac{-2y}{-2} < \frac{-3x}{-2} - \frac{26}{-2}$

$y > \frac{3}{2}x + 13$

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 #

$$x + y = 30$$
$$+\ x - y = 12$$
$$2x = 42$$
$$\frac{2x}{2} = \frac{42}{2}$$
$$x = 21$$

$$21 + y = 30$$
$$-21 \quad -21$$
$$y = 9$$

21, 9

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 = 1st #

y = 2nd #

$x - y = 9$

$x + 2y = 27$

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.

$x = 1^{st}\#$ $y = 2^{nd}\#$

$2(x + y = 20)$

$3x - 2y = 40$

$+\ 2x + 2y = 40$

$3x - 2y = 40$

$5x = 80$

$\frac{5x}{5} = \frac{80}{5}$

$x = 16$

$16 + y = 20$

$-16 \quad -16$

$y = 4$

16, 4

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

x = 1st # y = 2nd #

$x + y = 25$

$x = 2y + 7$

$(2y + 7) + y = 25$

$3y + 7 = 25$

$-7 \quad -7$

$\frac{3y}{3} = \frac{18}{3}$

$y = 6$

$x = 2(6) + 7$

$x = 19$

19, 6

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 = $ per box of envelopes

y = $ per box of paper

$$3x + 4y = 13.25$$
$$2x + 6y = 17.00$$

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.

X = $ per orange

y = $ per apple

$-5(12x + 7y = 5.36)$

$7(8x + 5y = 3.68)$

$-60x - 35y = -26.80$

$+ \quad 56x + 35y = 25.76$

$-4x = -1.04$

$\frac{-4x}{-4} = \frac{-1.04}{-4}$

$x = \$0.24$

$8(0.24) + 5y = 3.68$

$1.92 + 5y = 3.68$

$-1.92 \quad -1.92$

$5y = 1.76$

$y = \$0.35$

Orange $0.24

Apple $0.35

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.

x = $ per pen
y = $ 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 = cost per glove set

y = cost per hat

$$\begin{array}{r} 2x+4y=43.00 \\ -\ 2x+2y=30.00 \\ \hline 2y=13.00 \end{array}$$

$\frac{2y}{2} = \frac{13.00}{2}$

$y = \$6.50$ per hat

$2x+2(6.50)=30$

$2x+13=30$

$-13 \quad -13$

$\frac{2x}{2} = \frac{17}{2}$

$x = \$8.50$ per pair of gloves

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 mower

y = # of large mower

$$x + y = 30$$

$$249.99x + 329.99y = 8379.70$$

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 = baseballs

y = 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?

x = hot dogs y = popcorn bags

27 13

$-2.25(x + y = 40)$

$2.25x + 1.75y = 83.50$

$-2.25x - 2.25y = -90$

$+\ 2.25x + 1.75y = 83.50$

$-0.50y = -6.50$

$\frac{-0.50y}{-0.50} = \frac{-6.50}{-0.50}$

$y = 13$

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?

x = adult tickets y = student tickets

$$x + y = 321$$
$$3.50x + 2.50y = 937.50$$

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?

d = dimes 24 n = nickels 18

$-0.10(d + n = 42)$

$0.10d + 0.05n = 3.30$

$d + 18 = 42$

$-0.10d - 0.10n = -4.20$

$+ \quad 0.10d + 0.05n = 3.30$

$\frac{-0.05n}{-0.05} = \frac{-0.90}{-0.05}$

$n = 18$

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?

n = nickels
q = quarters

$-0.05(n + q = 42)$

$0.05n + 0.25q = 4.90$

$-0.05n - 0.05q = -2.10$

$+ \quad 0.05n + 0.25q = 4.90$

$0.20q = 2.80$

$\frac{0.20q}{0.20} = \frac{2.80}{0.20}$

$q = 14$

14 quarters

28 nickels