7-4 System of Equations Word Problems

○ Pam is playing with red and black marbles. <u>She has 42 marbles in all.</u> The number of red marbles she has is three more than twice the number of black marbles she has. How many of each color marble does Pam have?   Let r=red b=black

$$r + b = 42$$
$$r = 2b + 3$$

$$2b + 3 + b = 42$$
$$3b + 3 = 42$$
$$ -3 \quad -3$$
$$\frac{3b}{3} = \frac{39}{3}$$
$$\boxed{b = 13}$$

$$r + b = 42$$
$$r + 13 = 42$$
$$ -13 \quad -13$$
$$r = 29$$
$$\boxed{r = 29}$$

$$\boxed{\begin{array}{l} 13 \text{ black marbles} \\ 29 \text{ Red marbles} \end{array}}$$

2. Top Tunes sells CD's and tapes. Brianna bought 3 CDs and 2 tapes for $58. Ramon bought 1 CD and 4 tapes for $46. Determine the selling price for 1 CD and 1 tape.

C → $CD   t → $tape

$$-2(3c + 2t = 58) \rightarrow -6c - 4t = -116$$
$$1c + 4t = 46 \rightarrow 1c + 4t = 46$$
$$\frac{-5c}{-5} = \frac{-70}{-5}$$
$$\boxed{C = \$14}$$

$$3c + 2t = 58$$
$$3(14) + 2t = 58$$
$$42 + 2t = 58$$
$$-42 \qquad -42$$
$$\frac{2t}{2} = \frac{16}{2}$$
$$\boxed{t = \$8}$$

$$\boxed{\begin{array}{l} CD \text{ costs } \$14^{00} \\ \text{Tape costs } \$8.00 \end{array}}$$

3. Jack bought 3 slices of <u>cheese pizza</u> and 4 slices of <u>mushroom pizza</u> for a total cost of <u>$12.50</u>. Grace bought 3 slices of cheese pizza and 2 slices of mushroom pizza for a total cost of $8.50. Determine the selling price for one slice of cheese and one slice of mushroom.

C = $ cheese pizza   m = $ mushroom pizza

$$3c + 4m = 12.50 \rightarrow 3c + 4m = 12.50$$
$$-1(3c + 2m = 8.50) \rightarrow -3c - 2m = -8.50$$
$$\frac{2m}{2} = \frac{4.00}{2}$$
$$\boxed{m = 2.00}$$

$$3c + 4m = 12.50$$
$$3c + 4(2.00) = 12.50$$
$$3c + 8 = 12.50$$
$$-8 \quad -8$$
$$\frac{3c = 4.50}{}$$
$$\boxed{C = 1.50}$$

$$\boxed{\begin{array}{l} \text{Cheese pizza} = \$1,50 \\ \text{mushroom pizza} = \$2,00 \end{array}}$$

4. Erin has $0.80 in nickels and dimes. She has 12 coins in all. Find how many nickels and dimes Erin has by using a system of equations?

n → nickels   d → dimes

$$-0.05 \left(\quad n + d = 12 \quad \right) \rightarrow -0.05n - 0.05d = -.60$$
$$0.05n + 0.10d = 0.80 \qquad\qquad 0.05n + 0.10d = 0.80$$
$$0.05d = .2$$

$$\boxed{\text{nickels} = 8 \quad \text{dimes} = 4}$$

$$d = 4$$
$$n = 8$$

Practice 7-4   Name_____

1. Solve the following system of equation by Elimination

$$3x + 4y = 12.50$$
$$3x + 2y = 8.50$$

2. Sam and Odel have been selling frozen pizzas for a class fundraiser. Sam has sold half as many pizzas as Odel. Together they have sold a total of 126 pizzas. How many pizzas did Sam sell?

3. The cost of 3 markers and 2 pencils is $1.80. The cost of 4 markers and 6 pencils is $2.90. What is the cost of *each* item? Include appropriate units in your answer.