

NAME _____

Systems of Equation (SOE) Review / Quiz

- Solve the following system of equation problems.
- Next to each problem write which method you used to solve (substitution, elimination/addition, equal values method).
- Write your answer in (x, y) form.

1. Method Using: Elim / Addition

$$\begin{array}{r}
 2x + 7y = -1 \\
 2(-x - 2y = 2) + 2x + 7y = -1 \\
 \hline
 -2x - 4y = 4 \\
 \hline
 3y = 3 \\
 \frac{3y}{3} = \frac{3}{3} \\
 \boxed{y = 1}
 \end{array}$$

$$\begin{array}{r}
 2x + 7y = -1 \\
 2x + 7(1) = -1 \\
 2x + 7 = -1 \\
 \hline
 -8 \quad -7 \\
 \hline
 2x = -8 \\
 \frac{2x}{2} = \frac{-8}{2} \\
 \boxed{x = -4}
 \end{array}$$

Answer:
 $(-4, 1)$

2. Method Using: Substitution

$$\begin{array}{r}
 5x - 2y = 4 \\
 y = 5 - x \\
 \hline
 5x - 2(5 - x) = 4 \\
 5x - 10 - 2x = 4 \\
 5x - 10 + 2x = 4 \\
 \hline
 7x - 10 = 4 \\
 7x = 14 \\
 \frac{7x}{7} = \frac{14}{7} \\
 \boxed{x = 2}
 \end{array}$$

$$\begin{array}{r}
 7x = 14 \\
 \frac{7x}{7} = \frac{14}{7} \\
 \boxed{x = 2}
 \end{array}$$

$$\begin{array}{r}
 y = 5 - x \\
 y = 5 - 2 \\
 \hline
 \boxed{y = 3}
 \end{array}$$

Answer
 $2, 3$

3. Method Using: Equal Values

$$\begin{array}{r}
 y = 4.5 - x \\
 y = -2x + 6
 \end{array}$$

$$\begin{array}{r}
 y = y \\
 4.5 - x = -2x + 6 \\
 \hline
 +x \quad +x \\
 \hline
 4.5 = -x + 6 \\
 \hline
 -6 \quad -6 \\
 \hline
 -1.5 = -x
 \end{array}$$

$$\begin{array}{r}
 -1.5 = -x \\
 \hline
 -1 \quad -1 \\
 \hline
 1.5 = x
 \end{array}$$

4. *Bonus. This year SGS decided to charge admissions for the Talent Showcase. The school sold adult tickets for \$5 and child tickets for \$2. The total amount made in ticket sales was \$840. All together, the school sold a total 258 tickets. How many adult tickets and how many child tickets were sold?

- define your variables
- write your equations
- solve

$$\begin{array}{l}
 x = \# \text{ of child tix} \\
 y = \# \text{ of adult tix}
 \end{array}$$

$$2x + 5y = \$840$$

$$-2(x + y = 258)$$

$$\begin{array}{r}
 -2x + -2y = -516 \\
 + 2x + 5y = 840 \\
 \hline
 3y = 324 \\
 \frac{3y}{3} = \frac{324}{3} \\
 \boxed{y = 108}
 \end{array}$$

$$x + y = 258$$

$$258 - 108 =$$

$$\boxed{x = 150}$$

$$\begin{array}{r}
 y = 4.5 - x \\
 y = 4.5 - 1.5 \\
 \hline
 \boxed{y = 3}
 \end{array}$$

Answer
 $(1.5, 3)$

Name:

Chapter 6- Word Problems for Systems of Equations

Write the system of equations for the following word problems. Be sure to identify your variables. Then solve the system using the method you choose (equal values, substitution, elimination).

- The admission fee at a small fair is \$1.50 for children and \$4.00 for adults. On a certain day, 2200 people enter the fair and \$5050 is collected. How many children and how many adults attended?

$$1.50x + 4y = 5050 \quad x = \# \text{ of children} \quad x = 1500$$

$$x + y = 2200 \quad y = \# \text{ of adults} \quad y = 700$$

- A landscaping company placed two orders with a nursery. The first order was for 13 bushes and 4 trees, and totaled \$487. The second order was for 6 bushes and 2 trees, and totaled \$232. The bill does not list the per-item price. What is the cost of one bush and of one tree?

$$x = \text{Cost of bush} \quad 13x + 4y = 487 \quad 6x + 2y = 232 \quad x = \$23$$

$$y = \text{Cost of tree} \quad y = \$47$$

- One number is twenty-eight more than three times another number. If each number were multiplied by four, their difference would be 232. What are the numbers?

$$x = \text{one number} \quad 3x + 28 = y \quad 4y - 4x = 232 \quad x = 15$$

$$y = \text{another number} \quad y = 73$$

- A number is three less than four times another number. Their sum is one hundred two. What are the numbers?

$$x = \text{one number} \quad x = 4y - 3 \quad x = 81$$

$$y = \text{another number} \quad x + y = 102 \quad y = 21$$

- Your portfolio manager has suggested the following two stocks for investment purposes: Beta Banking, Inc. and Gamma Go Corp. Beta Banking stock costs \$36 per share, while Gamma Go stock costs \$45 per share. You have \$6,300 to invest and wish to hold twice as many Gamma Go shares as Beta Banking shares. How many units of each stock should you buy?

$$x = \# \text{ Beta shares} \quad 36B + 45G = 6,300$$

- *Bonus*** $y = \# \text{ gamma shares}$

$$2B = G$$

$$B = 50$$

$$G = 100$$

The airmail rate for letters to Europe is 45 cents per ounce and to Africa as 65 cents per ounce. If Shirley paid \$18.55 to send 35 one-ounce letters abroad, how many did she send to Africa?

$$x = \# \text{ letters to Europe} \quad .45x + .65y = 18.55 \quad x = 21$$

- *Bonus*** $y = \# \text{ letters to Africa}$

$$x + y = 35$$

$$y = 14$$

A passenger jet took three hours to fly 1800 miles in the direction of the jet stream. The return trip against the jet stream took four hours. What was the jet's speed in still air and the jet stream's speed? (Hint: $D=RT$)

$$R \cdot T = D$$

$P = \text{plane's speed}$

with jetstream $(p+w)3 = 1800$

$w = \text{wind speed}$

against jetstream $(p-w)4 = 1800$

$$P = 525 \text{ mph}$$

$$w = 75 \text{ mph}$$