

Name: Key Date: \_\_\_\_\_

## Systems of Linear Equations - Word Problems

### 4-Step Method:

1. Define variables
2. Write the system of equations
3. Solve showing all steps
4. State your solution in sentence form

1. You sell tickets for admission to your school play and collect a total of \$104. Admission prices are \$6 for adults and \$4 for children. You sold 21 tickets. How many adult tickets and how many children tickets did you sell?

Adult: A       $A + C = 21$   
 Children: C     $6A + 4C = 104$

$$\begin{array}{r} -4A - 6C = -126 \\ + 6A + 4C = 104 \\ \hline -2C = -22 \end{array}$$

$C = 11$   
 $A = 10$

10 Adult  
11 Children

2. Your family goes to a restaurant for dinner. There are 6 people in your family. Some order the chicken dinner for \$14.80 and some order the steak dinner for \$17. If the total bill was \$91, how many people ordered each type of dinner?

C = Chicken  
S = Steak

$C + S = 6$   
 $14.80C + 17S = 91$

$$\begin{array}{r} -17C - 17S = -102 \\ 14.80C + 17S = 91 \\ \hline 2.2C = 11 \end{array}$$

$C = 5$   
 $S = 1$

5 Chicken  
1 Steak

3. You bought the meat for Saturday's cookout. A package of hot dogs cost \$1.60 and a package of hamburger cost \$5. You bought a total of 8 packages of meat and you spent \$23. How many packages of hamburger meat did you buy?

Hotdogs: D  
Hamburgers: H

$D + H = 8$   
 $1.60D + 5H = 23$

$$\begin{array}{r} -5D - 5H = -40 \\ 1.60D + 5H = 23 \\ \hline 3.4D = 17 \end{array}$$

$D = 5$   
 $H = 3$

Hamburgers: 3

4. Casey orders 3 pizzas and 2 orders of breadsticks for a total of \$29.50. Rachel orders 2 pizzas and 3 orders of breadsticks for a total of \$23. How much does a pizza cost?

Pizza: P      Casey:  $3P + 2B = 29.50$   
Breadsticks: B    Rachel:  $2P + 3B = 23$

$$\begin{array}{r} -6P - 4B = -59 \\ 4P + 9B = 69 \\ \hline 5B = 10 \end{array}$$

$B = 2$   
 $P = 8.5$

Pizza: 8.50

5. Rent-A-Car rents compact cars for a fixed amount per day plus a fixed amount for each mile driven. Benito rented a car for 6 days, drove it 550 miles, and spent \$337. Lisa rented the same car for 3 days, drove it 350 miles, and spent \$185. What is the charge per day and the charge per mile for the compact car?

Benito:  $6D + 550M = 337$   
Lisa:  $3D + 350M = 185$

$$\begin{array}{r} 6D + 550M = 337 \\ -6D - 700M = -370 \\ \hline -150M = -33 \end{array}$$

\$0.22/mile  
\$36/Day

6. Beach Hotel in Cancun is offering two weekend specials. One includes a 2-night stay with 3 meals and cost \$195. The other includes a 3-night stay with 5 meals and cost \$300. What is the cost of a single meal?

$2n + 3m = 195$   
 $3n + 5m = 300$

$$\begin{array}{r} -6n - 9m = -585 \\ 6n + 10m = 600 \\ \hline m = 15 \end{array}$$

$m = 15$   
 $n = 75$

Meal: \$15

Systems of Equations Practice

1. The Landscaper, Green or Bust, was charging \$300 for the plants and materials and then \$30 per hour. The second landscaper, Uprooted, is charging \$450 for the plants and materials and then \$25 per hour. At the what price will the two companies cost the same? How many hours will that be?

Cost: C      1st:  $C = 300 + 30h$   
 hour: h      2nd:  $C = 450 + 25h$

$$\begin{array}{r} Q = 300 + 30h \\ -C = -450 - 25h \\ \hline 0 = -150 + 5h \\ 150 = 5h \\ h = 30 \end{array}$$

@ 30 hours  
 $C = \$1200$

2. The only coins that Alexis has are dimes and quarters. Her coins have a total value of \$5.80. She has a total of 40 coins.

$$\begin{array}{l} Q + D = 40 \\ .25Q + .10D = 5.80 \end{array}$$

$$\begin{array}{l} Q + D = 40 \\ 25Q + 10D = 580 \end{array}$$

$$\begin{array}{r} -25Q - 25D = -1000 \\ 25Q + 10D = 580 \\ \hline -15D = -420 \\ D = 28 \\ Q = 12 \end{array}$$

She has 28 Dimes & 12 Quarters

3. A test has twenty questions worth 100 points. The test consists of True/False questions worth 3 points each and multiple choice questions worth 11 points each. How many multiple choice questions are on the test?

T: True/False  
 M: Multiple Choice

$$\begin{array}{l} 3T + 11M = 100 \\ T + M = 20 \end{array}$$

$$\begin{array}{r} 3T + 11M = 100 \\ -3T - 3M = -60 \\ \hline 8M = 40 \\ M = 5 \\ T = 15 \end{array}$$

5 Multiple Choice & 15 True/False

4. Jane and Mary, twin sisters, have read a total of 36 books during the past year. Jane says that she read 3 more than twice as many books as Mary. How many books has each of the girls read during the last year?

Jane: J       $J + M = 36$   
 Mary: M       $J = 2M + 3$

$$\begin{array}{l} 2M + 3 + M = 36 \\ 3M = 33 \\ M = 11 \\ J = 25 \end{array}$$

Jane: 25 Books  
 Mary: 11 Books