Name: _____ 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?

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?

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?

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 $28. How much does a pizza cost?

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 spend $185. What is the charge per day and the charge per mile for the compact car?

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?

1. $-4[A + C = 21]$

$6A + 4C = 104$

$-4A - 4C = -84$

$2A = 20$ $\boxed{A = 10}$

$\boxed{C = 11}$

2. $C + S = 6$ $\quad C = 6 - S$

$14.8C + 17S = 91$

$14.8(6-S) + 17S = 91$

$88.8 - 14.8S + 17S = 91$

$2.2S = 2.2$ $\boxed{S = 1 \quad C = 5}$

3. $D + H = 8$ $\quad D = 8 - H$

$1.6D + 5H = 23$

$1.6(8-H) + 5H = 23$

$12.8 - 1.6H + 5H = 23$

$12.8 + 3.4H = 23$

$3.4H = 10.2$

$\boxed{H = 3}$

$\boxed{D = 5}$

4. $[3P + 2B = 29.5]\ 2$

$[2P + 3B = 23]\ -3$

$6P + 4B = 59$

$-6P - 9B = -69$

$-5B = -10$ $\boxed{B = 2}$

$2P + 3(2) = 23$

$2P + 6 = 23$

$2P = 17$

$P = 8.5$

$B = \$2, \quad P = \$8.5$

5. $6D + 550M = 337$

$+2[3D + 350M = 185]$

$6D + 550M = 337$

$-6D - 700M = 370$

$-150M = -33$

$M = \$.22$

$3D + 350(.22) = 185$

$3D + 77 = 185$

$3D = 108$

$D = \$36$

$\$36$/day $\$.22$/mile

6.

$-5[2N + 3M = 195]$

$3[3N + 5M = 300]$

$-10N - 15M = -975$

$9N + 15M = 900$

$N = 75$

$2(75) + 3M = 195$

$150 + 3M = 195$

$3M = 45$

$M = 15$

$M = \$15$

7. You and your friend go to a Mexican restaurant. You order 2 tacos and 2 enchiladas. Your friend orders 3 tacos and 1 enchilada. Your bill was $4.80. Your friend's bill was $4.00. What was the price of an enchilada?

8. For a community bake sale, you purchases 12 pounds of sugar and 15 pounds of flour. Your total cost was $9.30. The next day, you purchased 4 pounds of sugar and 10 pounds of flour. Your total cost the second day was $4.60. Find the cost of a pound of sugar and a pound of flour.

9. A travel agency offers different getaways to New York. Plan A includes hotel accommodations for 3-nights and 2-pair of baseball tickets for $645. Plan B includes hotel accommodations for 5-nights and 4-pairs of baseball tickets for $1135. How much does a single hotel cost and how much does a single pair of baseball tickets cost?

10. Tickets for the theater are $5 for the balcony and $10 for the orchestra. If 600 tickets were sold and the total receipts were $4750, how many tickets of each type were sold?

11. You bought 5 pairs of socks for $19. The wool socks you bought cost $5 per pair. The cotton socks you bought cost $3 per pair. How many of each type of sock did you buy?

12. A sporting good store sells right-handed and left-handed baseball gloves. In one month, 12 gloves were sold for a total revenue of $528. Right-handed gloves cost $48 and left-handed gloves cost $36. How many right-handed gloves were sold?

7. $2t + 2e = 4.8$

$3t + e = 4.00$

$e = 4 - 3t$

$2t + 2(4 - 3t) = 4.8$

$2t + 8 - 6t = 4.8$

$-4t = -3.2$

$t = 0.8$

$3(.8) + e = 4$

$2.4 + e = 4$

$e = 1.6$

enchiladas cost $1.60

tacos cost $.80

8. $12s + 15f = 9.3$

$-3[4s + 10f = 4.6]$

$12s + 15f = 9.3$

$-12s - 30f = -13.8$

$-15f = -4.5$

$f = 0.3$

$12s + 15(.3) = 9.3$

$12s + 4.5 = 9.3$

$12s = 4.8 \quad s = 0.4$

Sugar is $.4/lbs

flour is $0.3/lbs

9. $-2[3H + 2B = 645]$

$5H + 4B = 1135$

$-6H - 4B = -1290$

$H = 155$

Hotel \$155/night

Baseball \$90/pair

$3(155) + 2B = 645$

$2B = 180$

$B = 90$

10. $5B + 10R = 4750$

$-5[B + R = 600]$

$-5B - 5R = -3{,}000$

$5B + 10R = 4750$

$5R = 1750$

$R = 350$ ← orchestra seats sold

$B = 250$ ← Balcony seats sold

11. $W + C = 5$ $\quad W = 5 - C$

$5W + 3C = 19$

$5(5 - C) + 3C = 19$

$25 - 5C + 3C = 19$

$-2C = -6$

$C = 3 \quad W = 2$

2 Wool socks

3 cotton socks

12. $48R + 36L = 528$

$R + L = 12$

$R = 12 - L$

$48(12 - L) + 36L = 528$

$576 - 48L + 36L = 528$

$-12L = -48$ $\quad$ $L = 4 \quad R = 8$

 Name_____

Systems of Equations Word Problems

Date_____ Period____

1) Find the value of two numbers if their sum is 12 and their difference is 4.

2) The difference of two numbers is 3. Their sum is 13. Find the numbers.

3) Flying to Kampala with a tailwind a plane averaged 158 km/h. On the return trip the plane only averaged 112 km/h while flying back into the same wind. Find the speed of the wind and the speed of the plane in still air.

4) The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

5) The sum of the digits of a certain two-digit number is 7. Reversing its digits increases the number by 9. What is the number?

6) A boat traveled 210 miles downstream and back. The trip downstream took 10 hours. The trip back took 70 hours. What is the speed of the boat in still water? What is the speed of the current?

7) The state fair is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 8 vans and 8 buses with 240 students. High School B rented and filled 4 vans and 1 bus with 54 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

8) The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 1 van and 6 buses with 372 students. High School B rented and filled 4 vans and 12 buses with 780 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

9) Brenda's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 3 senior citizen tickets and 9 child tickets for a total of $75. The school took in $67 on the second day by selling 8 senior citizen tickets and 5 child tickets. What is the price each of one senior citizen ticket and one child ticket?

10) Matt and Ming are selling fruit for a school fundraiser. Customers can buy small boxes of oranges and large boxes of oranges. Matt sold 3 small boxes of oranges and 14 large boxes of oranges for a total of $203. Ming sold 11 small boxes of oranges and 11 large boxes of oranges for a total of $220. Find the cost each of one small box of oranges and one large box of oranges.

11) A boat traveled 336 miles downstream and back. The trip downstream took 12 hours. The trip back took 14 hours. What is the speed of the boat in still water? What is the speed of the current?

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Systems of Equations Word Problems

Date_____ Period____

1) Find the value of two numbers if their sum is 12 and their difference is 4.

4 and 8

$x + y = 12$

$x - y = 4$

2) The difference of two numbers is 3. Their sum is 13. Find the numbers.

5 and 8

$x + y = 13$

$x - y = 3$

3) Flying to Kampala with a tailwind a plane averaged 158 km/h. On the return trip the plane only averaged 112 km/h while flying back into the same wind. Find the speed of the wind and the speed of the plane in still air.

Plane: 135 km/h, Wind: 23 km/h

$P + W = 158$

$P - W = 112$

4) The school that Stefan goes to is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 1 child ticket for a total of $38. The school took in $52 on the second day by selling 3 senior citizen tickets and 2 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

senior citizen ticket: $8, child ticket: $14

$3S + C = 38$

$3S + 2C = 52$

5) The sum of the digits of a certain two-digit number is 7. Reversing its digits increases the number by 9. What is the number?

34

$10x + y = \text{number}$

$x + y = 7$

$10y + x - 10x - y = 9$

$-9x + 9y = 9$

$1.8y = 7.2$

$y = 4 \quad x = 3$

6) A boat traveled 210 miles downstream and back. The trip downstream took 10 hours. The trip back took 70 hours. What is the speed of the boat in still water? What is the speed of the current?

boat: 12 mph, current: 9 mph

$B + W = 21$

$B - W = 3$

7) The state fair is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 8 vans and 8 buses with 240 students. High School B rented and filled 4 vans and 1 bus with 54 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

Van: 8, Bus: 22

$8V + 8B = 240$

$4V + B = 54$

8) The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 1 van and 6 buses with 372 students. High School B rented and filled 4 vans and 12 buses with 780 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

Van: 18, Bus: 59

$V + 6B = 372$

$4V + 12B = 780$

9) Brenda's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 3 senior citizen tickets and 9 child tickets for a total of $75. The school took in $67 on the second day by selling 8 senior citizen tickets and 5 child tickets. What is the price each of one senior citizen ticket and one child ticket?

senior citizen ticket: $4, child ticket: $7

$3s + 9c = 75$

$8s + 5c = 67$

10) Matt and Ming are selling fruit for a school fundraiser. Customers can buy small boxes of oranges and large boxes of oranges. Matt sold 3 small boxes of oranges and 14 large boxes of oranges for a total of $203. Ming sold 11 small boxes of oranges and 11 large boxes of oranges for a total of $220. Find the cost each of one small box of oranges and one large box of oranges.

small box of oranges: $7, large box of oranges: $13

$3s + 14L = 203$

$11s + 11L = 220$

11) A boat traveled 336 miles downstream and back. The trip downstream took 12 hours. The trip back took 14 hours. What is the speed of the boat in still water? What is the speed of the current?

boat: 26 mph, current: 2 mph

$B + W = 28$

$B - W = 24$