

Chapter 6.4 Word Problems: Solving with Systems (Day One)

- Jim has half as many marbles as Sue. Together they have 150 marbles. How many marbles does each have?
2. Kristy spent \$131 on shirts. Fancy shirts cost \$28 and plain shirts cost \$15. If she bought a total of 7 then how many of each kind did she buy?
3. At Elisa's Printing Company LLC there are two kinds of printing presses: Model A which can print 70 books per day and Model B which can print 55 books per day. The company owns 14 total printing presses and this allows them to print 905 books per day. How many of each type of press do they have?
4. All 231 students in Math Club went on a field trip. Some students rode in vans which hold 7 students each and some students rode in buses which hold 25 students each. How many of each type of vehicle did they use if there were 15 vehicles total?
5. 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?
6. 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?
7. A farmhouse shelters 10 animals. Some are pigs and some are ducks. Altogether there are 36 legs. How many of each animal are there?

8. There are 11 animals in a farmhouse. Some are goats and some are chickens. Altogether there are 34 legs. How many of each animal are there?
9. The perimeter of a rectangle is 104 cm. The length is 12 cm more than the width. Find the length and the width.
10. A rectangle has a perimeter of 58 inches. The length is one more than 3 times the width. Find the length and the width.
11. The length of a rectangle is 7 inches more than three times the width. The perimeter is 86 inches. Find the length and width.
12. Zelma is eighteen years older than her son. She was three times as old as he was one year ago. How old are they now?
13. Timothy is twice as old as his daughter. In six years Timothy's age will be three times what his daughter's age was six years ago. How old are they at present?
14. A mother is 27 years older than her daughter. A year ago, the mother was twice as old as the daughter. How old is each now?
15. Jeff is twice as old as Rebecca. Four years ago, Jeff's age was one more than the product of three and Rebecca's age at the time. How old are Jeff and Rebecca?

16. A Burrito Loco a customer bought 1 taco and a Pepsi for \$2.10. Another customer bought 2 tacos and 3 Pepsis for \$5.15. What is the price of 1 taco and 1 Pepsi?
17. Four oranges and five apples cost \$3.56. Three oranges and four apples cost \$2.76. Find the cost of an orange and the cost of an apple.
18. Six pineapples and three coconuts cost \$3.36. Two pineapples and five coconuts cost \$3.04. Find the cost of a pineapple and a coconut.
19. A burger and three orders of fries cost \$3.86. Five burgers and two orders of fries cost \$6.43. How much does a burger cost? How much does an order of fries cost?
20. Two bagels and a glass of juice is \$1.20. Three bagels and two glasses of juice cost \$2.05. Find the cost of a bagel and the cost of a glass of juice.

**Challenge:**

21. Molly's Custom Kitchen Supplies sells handmade forks and spoons. It costs the store \$1.70 to buy the supplies to make a fork and \$1.30 to buy the supplies to make a spoon. The store sells forks for \$5.60 and spoons for \$5.40. Last April Molly's Custom Kitchen Supplies spent \$37.90 on materials for forks and spoons. They sold the finished products for a total of \$147.20. How many forks and how many spoons did they make last April?

Key

1. Jim has half as many marbles as Sue. Together they have 150 marbles. How many marbles does each have?

$$\begin{aligned} \frac{1}{2}S &= J \\ J + S &= 150 \end{aligned}$$

$$\begin{aligned} \frac{1}{2}S + S &= 150 \\ 1\frac{1}{2}S &= 150 \\ S &= 100 \end{aligned}$$

Jim has 50  
Sue has 100.

2. Kristy spent \$131 on shirts. Fancy shirts cost \$28 and plain shirts cost \$15. If she bought a total of 7 then how many of each kind did she buy?

$$\begin{aligned} 28F + 15P &= 131 \\ F + P &= 7 \end{aligned}$$

$$\begin{aligned} 28F + 15(7-F) &= 131 \\ 28F + 105 - 15F &= 131 \\ 105 + 13F &= 131 \\ 13F &= 26 \end{aligned}$$

2 fancy shirts  
5 plain shirts

3. At Elisa's Printing Company LLC there are two kinds of printing presses: Model A which can print 70 books per day and Model B which can print 55 books per day. The company owns 14 total printing presses and this allows them to print 905 books per day. How many of each type of press do they have?

$$\begin{aligned} 70A + 55B &= 905 \\ A + B &= 14 \end{aligned}$$

$$\begin{aligned} 70A + 55(14-A) &= 905 \\ 70A + 770 - 55A &= 905 \\ 15A &= 135 \end{aligned}$$

9 types of Model A & 5 types of Model B

4. All 231 students in Math Club went on a field trip. Some students rode in vans which hold 7 students each and some students rode in buses which hold 25 students each. How many of each type of vehicle did they use if there were 15 vehicles total?

$$\begin{aligned} 7V + 25B &= 231 \\ V + B &= 15 \end{aligned}$$

$$\begin{aligned} 7V + 25(15-V) &= 231 \\ 7V + 375 - 25V &= 231 \\ -18V &= -144 \\ V &= 8 \end{aligned}$$

Need 8 vans & 7 buses

5. 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?

$$\begin{aligned} 3T/F + 11MC &= 100 \\ T/F + MC &= 20 \end{aligned}$$

$$\begin{aligned} 3T/F + 11(20-T/F) &= 100 \\ 3T/F + 220 - 11T/F &= 100 \\ 220 - 8T/F &= 100 \\ -8T/F &= -120 \end{aligned}$$

15 True/False & 5 Multiple Choice

6. 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?

$$\begin{aligned} 1V + 6b &= 372 \\ 4V + 12b &= 780 \end{aligned}$$

$$\begin{aligned} 4(372 - 6b) + 12b &= 780 \\ 1488 - 24b + 12b &= 780 \\ -12b &= -708 \end{aligned}$$

$$b = 59$$

The bus can carry 59 students & the van can carry 18 students

- ✓ 7. A farmhouse shelters 10 animals. Some are pigs and some are ducks. Altogether there are 36 legs. How many of each animal are there?

$$P + D = 10$$

$$4P + 2D = 36$$

$$4P + 2(10 - P) = 36$$

$$4P + 20 - 2P = 36$$

$$20 + 2P = 36$$

8 pigs  
2 ducks

- ✓ 8. There are 11 animals in a farmhouse. Some are goats and some are chickens. Altogether there are 34 legs. How many of each animal are there?

$$G + C = 11$$

$$4G + 2C = 34$$

$$4G + 2(11 - G) = 34$$

$$4G + 22 - 2G = 34$$

$$22 + 2G = 34$$

6 Goats  
5 Chickens

9. The perimeter of a rectangle is 104 cm. The length is 12 cm more than the width. Find the length and the width.

$$104 = 2w + 2l$$

$$l = 12 + w$$

$$104 = 2w + 2(12 + w)$$

$$104 = 4w + 24$$

$$80 = 4w$$

width = 20 cm  
length = 32 cm

- ✓ 10. A rectangle has a perimeter of 58 inches. The length is one more than 3 times the width. Find the length and the width.

$$58 = 2l + 2w$$

$$l = 3w + 1$$

$$58 = 2(1 + 3w) + 2w$$

$$58 = 2 + 6w + 2w$$

$$56 = 8w$$

width 7 in.  
length 22 in.

- ✓ 11. The length of a rectangle is 7 inches more than three times the width. The perimeter is 86 inches. Find the length and width.

$$l = 3w + 7$$

$$86 = 2l + 2w$$

$$86 = 2(3w + 7) + 2w$$

$$86 = 6w + 14 + 2w$$

$$86 = 8w + 14$$

$$72 = 8w$$

width = 9 in.  
length = 34 in.

- ✓ 12. Zelma is eighteen years older than her son. She was three times as old as he was one year ago. How old are they now?

$$Z = 18 + S$$

$$Z - 1 = 3(S - 1)$$

$$18 + S - 1 = 3(S - 1)$$

$$S + 17 = 3S - 3$$

$$S + 20 = 3S$$

$$20 = 2S$$

Son is 10 years  
Zelma is 28 yrs.

- ✓ 13. Timothy is twice as old as his daughter. In six years Timothy's age will be three times what his daughter's age was six years ago. How old are they at present?

$$T = 2D$$

$$T + 6 = 3(D - 6)$$

$$2D + 6 = 3(D - 6)$$

$$2D + 6 = 3D - 18$$

$$2D + 24 = 3D$$

$$24 = D$$

daughter = 24 yrs.  
Timothy = 48 yrs.

- ✓ 14. A mother is 27 years older than her daughter. A year ago, the mother was twice as old as the daughter. How old is each now?

$$M = 27 + D$$

$$M - 1 = 2(D - 1)$$

$$27 + D - 1 = 2(D - 1)$$

$$26 + D = 2D - 2$$

$$28 + D = 2D$$

$$28 = D$$

daughter is 28 yrs.  
mother is 55 years

- ✓ 15. Jeff is twice as old as Rebecca. Four years ago, Jeff's age was one more than the product of three and Rebecca's age at the time. How old are Jeff and Rebecca?

$$J = 2R$$

$$J - 4 = 3(R - 4) + 1$$

$$\begin{aligned} 2R - 4 &= 3(R - 4) + 1 \\ 2R - 4 &= 3R - 12 + 1 \\ 2R - 4 &= 3R - 11 \\ 2R + 7 &= 3R \\ 7 &= R \end{aligned}$$

Rebecca = 7 years  
Jeff = 14 years

- ✓ 16. A Burrito Loco a customer bought 1 taco and a Pepsi for \$2.10. Another customer bought 2 tacos and 3 Pepsis for \$5.15. What is the price of 1 taco and 1 Pepsi?

$$\begin{aligned} 1t + 1P &= \$2.10 \\ 2t + 3P &= \$5.15 \end{aligned}$$

$$\begin{aligned} 2t + 2P &= 4.20 \\ -2t + 3P &= 5.15 \\ \hline -1P &= -0.95 \end{aligned}$$

Pepsi = \$0.95  
Tacos = \$1.15

- ✓ 17. Four oranges and five apples cost \$3.56. Three oranges and four apples cost \$2.76. Find the cost of an orange and the cost of an apple.

$$\begin{aligned} 4o + 5a &= \$3.56 \\ 3o + 4a &= \$2.76 \end{aligned}$$

$$\begin{aligned} 12o + 15a &= 10.68 \\ -12o + 16a &= 11.04 \\ \hline -1a &= -0.36 \end{aligned}$$

apples = \$0.36  
Oranges = \$0.44

- ✓ 18. Six pineapples and three coconuts cost \$3.36. Two pineapples and five coconuts cost \$3.04. Find the cost of a pineapple and a coconut.

$$\begin{aligned} 6P + 3C &= \$3.36 \\ 2P + 5C &= \$3.04 \end{aligned}$$

$$\begin{aligned} 6P + 3C &= \$3.36 \\ -6P + 15C &= -9.12 \\ \hline 12C &= -5.76 \end{aligned}$$

Coconuts = \$0.48  
Pineapples = \$0.32

- ✓ 19. A burger and three orders of fries cost \$3.86. Five burgers and two orders of fries cost \$6.43. How much does a burger cost? How much does an order of fries cost?

$$\begin{aligned} 1B + 3F &= \$3.86 \\ 5B + 2F &= \$6.43 \end{aligned}$$

$$\begin{aligned} 5(3.86 - 3F) + 2F &= 6.43 \\ 19.30 - 15F + 2F &= 6.43 \\ -13F &= -12.87 \\ F &= .99 \end{aligned}$$

Burger = \$0.80  
Fries = \$0.99

- ✓ 20. Two bagels and a glass of juice is \$1.20. Three bagels and two glasses of juice cost \$2.05. Find the cost of a bagel and the cost of a glass of juice.

$$\begin{aligned} 2b + 1j &= \$1.20 \\ 3b + 2j &= \$2.05 \end{aligned}$$

$$\begin{aligned} 4b + 2j &= 2.40 \\ -3b + 2j &= 2.05 \\ \hline 1b &= .35 \end{aligned}$$

bagel = \$0.35  
juice = \$0.50

**Challenge:**

- ✓ 21. Molly's Custom Kitchen Supplies sells handmade forks and spoons. It costs the store \$1.70 to buy the supplies to make a fork and \$1.30 to buy the supplies to make a spoon. The store sells forks for \$5.60 and spoons for \$5.40. Last April Molly's Custom Kitchen Supplies spent \$37.90 on materials for forks and spoons. They sold the finished products for a total of \$147.20. How many forks and how many spoons did they make last April?

$$\begin{aligned} (\$1.70f + \$1.30s = 37.90) \quad 5.60 \\ (\$5.60f + \$5.40s = \$147.20) \quad 1.70 \end{aligned}$$

$$\begin{aligned} 9.52f + 7.28s &= 212.24 \\ -9.52f + 9.18s &= 250.24 \\ \hline -1.9s &= -38 \\ s &= 20 \end{aligned}$$

20 spoons & 7 forks