

More Systems Story Problems! (Hooray!)
Real- Life applications

Write the system of equations for every problem. Solve # 2, 5, 6, 7, 8, 10, 11 & 15

1. The Lakers scored a total of 80 points in a basketball game against the Bulls. The Lakers made a total of 37 two-point and three-point baskets. How many two point shots did the Lakers make? How many three point shots did the Lakers make?

$$\begin{aligned} 2x + 3y &= 80 \\ x + y &= 37 \end{aligned}$$

2. Taylor and Aliya ~~friend~~ go to Taco Bell for lunch. Taylor orders 3 soft tacos and 3 burritos and her total bill was \$11.25. Aliya's bill is \$10.00 for 4 tacos and 2 burritos. How much do the soft tacos and burritos cost each?

Tacos
\$1.25
Burritos
\$2.50

$$\begin{aligned} 2(3t + 3b) &= 11.25 \\ -3(4t + 2b) &= 10 \end{aligned}$$

$$\begin{aligned} 6t + 6b &= 22.5 \\ -12t + 6b &= -30 \end{aligned}$$

$$\begin{aligned} -6t &= -7.5 \\ t &= 1.25 \\ 3(1.25) + 3(b) &= 11.25 \\ 3.75 + 3b &= 11.25 \\ b &= 2.5 \end{aligned}$$

3. All of the 8th grade teachers and students from Monarch Middle School went on a field trip to an art museum. Tickets were \$5.50 each for teachers and \$2.50 each for students and the group paid \$47.00 in total. The next month, the same group visited a science museum where the tickets cost \$16.50 for each teacher and \$10.00 for each student. That visit totaled \$166.00. Find the number of teachers and students in the group.

$$\begin{aligned} -4(5.5t + 2.5k) &= 47 \\ 16.5t + 10k &= 166 \end{aligned}$$

$$\begin{aligned} -22t + (-10k) &= -188 \\ 16.5t + 10k &= 166 \end{aligned}$$

$$\begin{aligned} -5.5t &= -22 \\ t &= 4 \end{aligned}$$

4 teachers
10 kids

$$\begin{aligned} 5.5(4) + 2.5k &= 47 \\ 22 + 2.5k &= 47 \end{aligned}$$

$$k = 10$$

4. At Kohrman's Printing Company LLC there are two kinds of printing machines: Model A can print 70 books per day and Model B can print 55 books per day. The company owns 14 printing machines altogether and can print 905 books per day. How many of each type of machine does the company own?

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

- 5) Stephanie and Caroline decide to spend the afternoon at an amusement park enjoying their favorite activities, the water slide and the Ferris wheel. Their tickets are stamped each time they slide or ride. At the end of the afternoon they have the following tickets. How much does it cost to ride the Ferris wheel? How much does it cost to slide on the water slide?

	Stephanie's Tickets	Caroline's Tickets
Water Slide	3	2
Ferris Wheel	3	3
	\$17.70	\$15.55

$$-1 \begin{cases} 3w + 3f = 17.70 \\ 2w + 3f = 15.55 \end{cases}$$

$$\begin{array}{r} -3w - 3f = -17.70 \\ 2w + 3f = 15.55 \\ \hline \end{array}$$

$$\begin{array}{r} -w = -2.15 \\ w = 2.15 \end{array}$$

$$2(2.15) + 3f = 15.55$$

$$\begin{array}{r} 4.30 + 3f = 15.55 \\ -4.30 \quad -4.30 \\ \hline \end{array}$$

$$3f = 11.25$$

$$f = 3.75$$

Water Slide
\$2.15

Ferris wheel
\$3.75

- 6) The school that Merrill goes to is selling tickets to a talent show. On the first day of ticket sales the school sold 6 adult tickets and 5 child tickets for \$64. The school took in \$144 on the second day selling 12 adult tickets and 12 child tickets. What is the price of each type of ticket?

$$-2 \begin{cases} 6a + 5c = 64 \\ 12a + 12c = 144 \end{cases}$$

$$\begin{array}{r} -12a - 10c = -128 \\ 12a + 12c = 144 \\ \hline \end{array}$$

$$\begin{array}{r} 2c = 16 \\ c = 8 \end{array}$$

$$\begin{array}{r} 6a + 5(8) = 64 \\ 6a + 40 = 64 \\ -40 \quad -40 \\ \hline \end{array}$$

$$\frac{6a}{6} = \frac{24}{6}$$

$$a = 4$$

Adult ticket \$4

child ticket \$8

- 7) Bear and Ethan are selling pies for a school fundraiser. Bear sold 12 blueberry pies and 2 lemon meringue pies for a total of \$160. Ethan sold 12 lemon meringue and 11 blueberry pies for a total of \$350. What is the cost of each type of pie?

$$-6 \begin{cases} 12b + 2m = 160 \\ 11b + 12m = 350 \end{cases}$$

$$\begin{array}{r} -72b - 12m = -960 \\ 11b + 12m = 350 \\ \hline \end{array}$$

$$\begin{array}{r} -61b = -610 \\ \frac{-61b}{-61} = \frac{-610}{-61} \end{array}$$

$$b = 10$$

$$\begin{array}{r} 12(10) + 2m = 160 \\ 120 + 2m = 160 \\ -120 \quad -120 \\ \hline \end{array}$$

$$2m = 40$$

$$m = 20$$

Blueberry \$10
Lemon \$20

8. On Saturday, Maria earned \$51 for mowing three lawns and weeding three gardens. On Sunday, she earned \$25 for mowing one lawn and weeding 3 gardens. How much does she earn for each lawn she mows and each garden she weeds?

$$\begin{array}{r} 3l + 3g = 51 \\ -1(l + 3g = 25) \\ \hline 2l = 26 \end{array}$$

$$\begin{array}{r} 3l + 3g = 51 \\ -2l - 3g = -25 \\ \hline 2l = 26 \end{array}$$

$$2l = 26 \quad l = 13$$

$$\begin{array}{r} 13 + 3g = 25 \\ -13 \quad -13 \\ \hline 3g = 12 \\ g = 4 \end{array}$$

\$13 per lawn
\$4 per garden

9. James has one less than twice the number of DVD's Jeffrey has. Together they have 65 DVD's. How many DVD's do they each have?

$$x = 2y - 1$$

$$x + y = 65$$

$$2y - 1 + y = 65$$

$$3y = 66$$

$$y = 22$$

$$x = 43$$

10. Sydney weighs 8 pounds more than Anna does. Together they weigh 212 pounds. Find the weight of each girl.

$$S = a + 8$$

$$S + a = 212$$

$$a + 8 + a = 212$$

$$2a + 8 = 212$$

$$\begin{array}{r} 2a + 8 = 212 \\ -8 \quad -8 \\ \hline 2a = 204 \end{array}$$

$$\frac{2a}{2} = \frac{204}{2}$$

$$a = 102$$

Anna = 102
Sydney = 110

11. A concession stand sells hot dogs for \$2 and hamburgers for \$3. One day 486 sandwiches were sold for a total of \$1,218. How many hot dog and hamburgers were sold?

$$\begin{array}{r} 2x + 3y = 1218 \\ -2(x + y = 486) \\ \hline \end{array}$$

$$\begin{array}{r} 2x + 3y = 1218 \\ -2x - 2y = -927 \\ \hline \end{array}$$

$$y = 246$$

$$\begin{array}{r} x + 246 = 486 \\ -246 \quad -246 \\ \hline \end{array}$$

$$x = 240$$

240 hot dogs
246 hamburgers

12. Two small pitchers and one large pitcher can hold 8 cups of water. One large pitcher minus one small pitcher constitutes 2 cups of water. How many cups can each pitcher hold?

$$\begin{aligned} 2s + l &= 8 \\ l - s &= 2 \end{aligned}$$

To solve...
rearrange

$$\begin{aligned} 2s + l &= 8 \\ -s + l &= 2 \end{aligned}$$

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

$$\begin{aligned} x + y &= 20 \\ 3x + 11y &= 100 \end{aligned}$$

14. A garden with a perimeter of 75 meters is to be 1.5 times as long as it is wide. What will be the dimensions of the garden? (hint: draw a picture)



$$\begin{aligned} 2w + 2l &= 75 \\ l &= 1.5w \end{aligned}$$

15. A cell phone company offers two plans to customers. The monthly charges are below.

BASIC Plan: \$20 service fee plus \$0.30 per minute

FREQUENT CALLER Plan: \$45 service fee plus \$0.20 per minute

cost do
* 9 \$ 4

a. Solve a system of equations to find the number of minutes of phone use that would cost the same under each plan.

$$\begin{aligned} C &= 20 + 0.3x \\ C &= 45 + 0.2x \end{aligned}$$

$$0.1x = 25$$

$$x = 250 \text{ minutes}$$

$$\begin{array}{r} 20 + 0.3x = 45 + 0.2x \\ -20 \quad -0.2x \quad -20 \quad -0.2x \end{array}$$

b. If you estimate that you will use your cell phone to make calls for 100 minutes each month, which plan is better? Explain your reasoning.

The Basic Plan