

#1

Solve the systems.

$$1.) \begin{cases} x + y + 4z = 5 \\ -2x + 2z = 3 \\ 3x + y - 2z = 0 \end{cases}$$

$$2.) \begin{cases} 5x - 3y + 2z = 39 \\ 4x + 4y - 3z = 34 \\ 3x - 2y + 6z = 14 \end{cases}$$

#2

Solve by any method. Is the system consistent, inconsistent, dependent or independent?

$$1) \begin{cases} y = x + 8 \\ 4x - y = 2 \end{cases}$$

$$2) \begin{cases} -\frac{1}{2}x + 4y = -8 \end{cases}$$

$$3) \begin{cases} 4x + 4y = 16 \\ 6x - 6y = 48 \end{cases}$$

$$3y = -3x + 12$$

#3

Solve the system using substitution.

$$\begin{cases} -5x + 7y = -41 \\ 14x + 2y = 50 \end{cases}$$

#4

Solve the system using elimination.

$$\begin{cases} \frac{2}{3}x = \frac{2}{3} - \frac{1}{6}y \\ -3x + y = -12 \end{cases}$$

#5

A parking meter contains \$8.25 in dimes and quarters. If the number of quarters is 9 more than twice the number of dimes, how many of each coin is in the parking meter?

- a) Identify your unknowns.
- b) Write a system of equations.
- c) Solve.

#6

A roller coaster has 19 cars that can seat a total of 84 people. Some of the cars seat 4 people and the others seat 5 people. How many cars seat 4 people? How many cars seat 5 people?

- a) Identify your unknowns.
- b) Write a system of equations.
- c) Solve.

#7

The difference of two numbers is 19. Four times the smaller is the same as 8 less than twice the larger. What are the numbers?

#8

Monica has \$1, \$5 and \$10 bills in her wallet that are worth \$96. If she had one more \$1 bill, she would have just as many \$1 bills as \$5 and \$10 bills combined. She has 23 bills total. How many of each denomination does she have?

- a) Identify unknowns
- b) write a system of equations
- c) solve

SLIDE #1

# Systems review - Answers

1.)  $\begin{cases} 1) x + y + 4z = 5 \\ 2) -2x + 2z = 3 \\ 3) 3x + y - 2z = 0 \end{cases}$

$(x, y, z) = (-1, 4, \frac{1}{2})$

1 and 3  $\begin{cases} x + y + 4z = 5 \\ -1(3x + y - 2z = 0) \end{cases} \Rightarrow \begin{cases} x + y + 4z = 5 \\ -3x - y + 2z = 0 \end{cases}$

$\begin{cases} -2x + 2z = 3 \\ -2x + 6z = 5 \end{cases} \Rightarrow \begin{cases} 2x - 2z = -3 \\ -2x + 6z = 5 \end{cases}$

$-2x + 6z = 5$

$\frac{4z}{4} = \frac{2}{4}$

$z = \frac{1}{2}$

$\begin{cases} -2x + 2z = 3 \\ -2x + 2(\frac{1}{2}) = 3 \\ -2x + 1 = 3 \\ -2x = 2 \\ \frac{-2x}{-2} = \frac{2}{-2} \end{cases}$

$x = -1$

$\begin{cases} x + y + 4z = 5 \\ (-1) + y + 4(\frac{1}{2}) = 5 \\ -1 + y + 2 = 5 \\ y + 1 = 5 \\ \frac{-1 \quad -1}{-1 \quad -1} \\ y = 4 \end{cases}$

2.)  $\begin{cases} 1) 5x - 3y + 2z = 39 \\ 2) 4x + 4y - 3z = 34 \\ 3) 3x - 2y + 6z = 14 \end{cases}$

$(x, y, z) = (8, -1, -2)$

1 and 3  $\begin{cases} -3(5x - 3y + 2z = 39) \Rightarrow -15x + 9y - 6z = -117 \\ 3x - 2y + 6z = 14 \end{cases} \Rightarrow \begin{cases} -12x + 7y = -103 \end{cases}$

2 and 3  $\begin{cases} 2(4x + 4y - 3z = 34) \Rightarrow 8x + 8y - 6z = 68 \\ 3x - 2y + 6z = 14 \end{cases} \Rightarrow \begin{cases} 11x + 6y = 82 \end{cases}$

$\begin{cases} 6(-12x + 7y = -103) \Rightarrow -72x + 42y = -618 \\ -7(11x + 6y = 82) \Rightarrow -77x - 42y = -574 \end{cases}$

$\begin{cases} 11(8) + 6y = 82 \\ 88 + 6y = 82 \\ \frac{-88}{-88} \quad \frac{-88}{-88} \\ 6y = -6 \\ \frac{6y}{6} = \frac{-6}{6} \\ y = -1 \end{cases}$

$\begin{cases} 3(8) - 2(-1) + 6z = 14 \\ 24 + 2 + 6z = 14 \\ 6z = -12 \\ \frac{6z}{6} = \frac{-12}{6} \\ z = -2 \end{cases}$

$\begin{cases} -149x = -1192 \\ x = 8 \end{cases}$

SLIDE #2

1)  $\begin{cases} y = x + 8 \\ 4x - y = 2 \end{cases}$

Substitution

$$\begin{aligned} 4x - (x + 8) &= 2 \\ 4x - x - 8 &= 2 \\ 3x - 8 &= 2 \\ +8 &+8 \\ 3x &= 10 \\ x &= \frac{10}{3} \end{aligned}$$

$$\begin{aligned} y &= \left(\frac{10}{3}\right) + 8 \\ y &= \frac{10}{3} + \frac{24}{3} \\ y &= \frac{34}{3} \end{aligned}$$

Consistent independent

$\left(\frac{10}{3}, \frac{34}{3}\right)$

2)  $\begin{cases} -\frac{1}{2}x + 4y = -8 \\ 3y = -3x + 12 \end{cases}$

Substitution

$$3y = -3x + 12 \Rightarrow \frac{3y}{3} = \frac{-3x + 12}{3}$$

$y = x + 4$

$$\begin{aligned} \frac{1}{2}x + 4(x + 4) &= -8 \\ \frac{1}{2}x + 4x + 16 &= -8 \\ \frac{9}{2}x + 16 &= -8 \\ \frac{9}{2}x &= -24 \\ \frac{2}{9} \left(\frac{9}{2}x\right) &= \frac{2}{9}(-24) \\ x &= -\frac{16}{3} \end{aligned}$$

$$\begin{aligned} y &= -\frac{16}{3} + 4 \\ y &= -\frac{16}{3} + \frac{12}{3} \\ y &= -\frac{4}{3} \end{aligned}$$

Consistent independent

$\left(-\frac{16}{3}, -\frac{4}{3}\right)$

3)  $\begin{cases} 4x + 4y = 16 \\ 6x - 6y = 48 \end{cases}$

$$\begin{aligned} \frac{4x + 4y}{4} &= \frac{16}{4} \Rightarrow x + y = 4 \\ \frac{6x - 6y}{6} &= \frac{48}{6} \Rightarrow x - y = 8 \end{aligned}$$

$\begin{cases} 6 + y = 4 \\ y = -2 \end{cases}$

$$\begin{aligned} \frac{2x}{2} &= \frac{12}{2} \\ x &= 6 \end{aligned}$$

$(6, -2)$

Consistent independent

Slide #3

$$\begin{cases} -5x + 7y = -41 \\ 14x + 2y = 50 \end{cases} \Rightarrow$$

$$\frac{14x + 2y}{2} = \frac{50}{2}$$

$$\begin{array}{r} 7x + y = 25 \\ -7x \quad -7x \end{array}$$

$$-5x + 7(-7x + 25) = -41$$

$$-5x - 49x + 175 = -41$$

$$\underline{-54x + 175 = -41}$$

$$\underline{-175 \quad -175}$$

$$\underline{-54x = -216}$$

$$\underline{-54 \quad -54}$$

$$x = 4$$

$$y = -7x + 25$$

$$y = -7(4) + 25$$

$$y = -28 + 25$$

$$y = -3$$

$$(4, -3)$$

Slide #4

$$\begin{cases} 6\left(\frac{2}{3}x = \frac{2}{3} - \frac{1}{6}y\right) \Rightarrow 4x = 4 - y \Rightarrow 4x + y = 4 \\ -3x + y = -12 \end{cases}$$

$$4x + y = 4 \Rightarrow 4x + y = 4$$

$$-1(-3x + y = -12) \Rightarrow 3x - y = 12$$

$$\frac{7x}{7} = \frac{16}{7}$$

$$x = \frac{16}{7}$$

$$-3x + y = -12$$

$$-3\left(\frac{16}{7}\right) + y = -12$$

$$-\frac{48}{7} + y = -12$$

$$\begin{array}{r} + \frac{48}{7} \\ + \frac{48}{7} \end{array}$$

$$y = \frac{48}{7} - \frac{84}{7}$$

$$y = -\frac{36}{7}$$

$$\left(\frac{16}{7}, -\frac{36}{7}\right)$$

Slide #5

$d = \# \text{ dimes}$   
 $q = \# \text{ quarters}$

$$\begin{cases} 0.10d + 0.25q = 8.25 \\ q = 2d + 9 \end{cases}$$

$$0.10d + 0.25(2d + 9) = 8.25$$

$$0.10d + 0.50d + 2.25 = 8.25$$

$$0.60d + 2.25 = 8.25$$

$$\begin{array}{r} 0.60d + 2.25 = 8.25 \\ -2.25 \quad -2.25 \\ \hline 0.60d = 6.00 \\ \hline 0.6 \quad \quad 0.6 \\ \hline d = 10 \end{array}$$

$$q = 2d + 9$$

$$q = 2(10) + 9$$

$$q = 20 + 9$$

$$q = 29$$

There are 10 dimes and 29 quarters

$d = 10$

Slide #6

$r = \# \text{ 4-person cars}$   
 $v = \# \text{ 5-person cars}$

$$\begin{cases} r + v = 19 \\ 4r + 5v = 84 \end{cases}$$

$$-4(r + v = 19) \Rightarrow -4r - 4v = -76$$

$$4r + 5v = 84 \Rightarrow \underline{4r + 5v = 84}$$

$$v = 8$$

$$r + v = 19$$

$$r + 8 = 19$$

$$\underline{-8 \quad -8}$$

$$r = 11$$

There are 8 cars which seat 5 people

Slide #7

X = smaller number  
 Y = larger number

$$\begin{cases} Y - X = 19 \\ 4X = 2Y - 8 \end{cases} \Rightarrow Y = X + 19$$

$$\begin{aligned} 4X &= 2(X + 19) - 8 \\ 4X &= 2X + 38 - 8 \\ 4X &= 2X + 30 \\ -2X &\quad -2X \\ \hline 2X &= 30 \\ \frac{2X}{2} &= \frac{30}{2} \\ X &= 15 \end{aligned}$$

$$\begin{aligned} Y &= X + 19 \\ Y &= 15 + 19 \\ Y &= 34 \end{aligned}$$

The smaller number is 15, the larger number is 34

Slide #8

X = # \$1 bills  
 Y = # \$5 bills  
 Z = # \$10 bills

$$\begin{cases} X + 5Y + 10Z = 96 \\ X + Y + Z = 23 \\ X + 1 = Y + Z \end{cases}$$

3 - solve for X  
 $X + 1 = Y + Z$   
 $X = Y + Z - 1$   
 substitute into 1 and 2

$$\begin{aligned} \textcircled{1} \quad (Y + Z - 1) + 5Y + 10Z &= 96 \\ 6Y + 11Z - 1 &= 96 \\ 6Y + 11Z &= 97 \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad (Y + Z - 1) + Y + Z &= 23 \\ 2Y + 2Z - 1 &= 23 \\ 2Y + 2Z &= 24 \end{aligned}$$

$$\begin{aligned} 6Y + 11Z = 97 &\Rightarrow 6Y + 11Z = 97 \\ -3(2Y + 2Z = 24) &\Rightarrow -6Y - 6Z = -72 \\ \hline 5Z &= 25 \\ \frac{5Z}{5} &= \frac{25}{5} \\ Z &= 5 \end{aligned}$$

$$\begin{aligned} 2Y + 2Z &= 24 & X = Y + Z - 1 \\ 2Y + 2(5) &= 24 & X = 7 + 5 - 1 \\ 2Y + 10 &= 24 & X = 11 \\ 2Y &= 14 \\ \frac{2Y}{2} &= \frac{14}{2} \\ Y &= 7 \end{aligned}$$

there are  
 11 - \$1 bills  
 7 - \$5 bills  
 5 - \$10 bills

### Systems of Equations

- For each problem:
- Identify the variables,
  - Write a system of equations to represent the situation,
  - Solve the system, and
  - Explain what the solution means in terms of the situation.

1. On Friday, 6 adults and 14 children went to the movies and the total admission was \$59. On Saturday, 2 adults and 9 children went to the same theater and paid \$30.50. How much does each ticket (adult and child) cost?

$a = \text{cost of adult ticket}$   
 $c = \text{cost of child ticket}$

$$\begin{cases} 6a + 14c = 59 \\ 2a + 9c = 30.50 \end{cases} \Rightarrow \begin{cases} 6a + 14c = 59 \\ -6a - 27c = -91.5 \end{cases}$$

$$\begin{aligned} & -13c = -32.50 \\ & c = 2.50 \end{aligned}$$

$$\begin{aligned} 2a + 9(2.50) &= 30.50 \\ 2a + 22.50 &= 30.50 \\ 2a &= 8 \\ a &= 4 \end{aligned}$$

Adult tickets cost \$4.00
Child tickets cost \$2.50

2. At Curly's Copies, Chad made 56 copies costing \$16. Color copies cost \$.75 each and black-and-white copies cost \$.10 each. How many copies of each type did Chad make?

$w = \text{black+white copies}$   
 $c = \text{color copies}$

$$\begin{cases} w + c = 56 \\ 0.1w + 0.75c = 16 \end{cases} \Rightarrow \begin{cases} -0.1w - 0.1c = -5.6 \\ 0.1w + 0.75c = 16 \end{cases}$$

$$\begin{aligned} & 0.65c = 10.4 \\ & c = 16 \end{aligned}$$

$$\begin{aligned} w + 16 &= 56 \\ w &= 40 \end{aligned}$$

Chad made 40 black+white copies and 16 color copies

3. On Saturday, Katie earned \$51 mowing 3 lawns and weeding 3 gardens. On Sunday, she earned \$25 mowing 1 lawn and weeding 3 gardens. How much does she earn for each garden she weeds and each lawn she mows?

$l = \text{lawns mowed}$   
 $g = \text{gardens weeded}$

$$\begin{cases} 3l + 3g = 51 \\ 1l + 3g = 25 \end{cases} \Rightarrow \begin{cases} 3l + 3g = 51 \\ -2l - 3g = -25 \end{cases}$$

$$\begin{aligned} & 2l = 26 \\ & l = 13 \end{aligned}$$

$$\begin{aligned} 3(13) + 3g &= 51 \\ 39 + 3g &= 51 \\ 3g &= 12 \\ g &= 4 \end{aligned}$$

Katie earns \$13 for each lawn she mows and \$4 for each garden she weeds

4. At a concession stand, two pretzels and two boxes of popcorn cost \$3.50. Two pretzels and four boxes of popcorn cost \$6.00. Find the cost of each item.

$p = \text{cost of pretzels}$   
 $c = \text{cost of popcorn}$

$$\begin{cases} 2p + 2c = 3.50 \\ 2p + 4c = 6.00 \end{cases} \Rightarrow \begin{cases} -2p - 2c = -3.50 \\ 2p + 4c = 6.00 \end{cases}$$

$$\begin{aligned} & 2c = 2.50 \\ & c = 1.25 \end{aligned}$$

$$\begin{aligned} 2p + 2(1.25) &= 3.50 \\ 2p + 2.50 &= 3.50 \\ 2p &= 1 \\ p &= 0.50 \end{aligned}$$

pretzels cost \$0.50  
popcorn costs \$1.25



5. Beth and Carol had dinner at a café. The total bill was \$14.40. Beth's meal cost \$2.00 more than Carol's. Find the cost of each woman's meal.

$$\begin{aligned} C &= \text{Carol's dinner} \\ E &= \text{Beth's dinner} \end{aligned} \quad \begin{cases} C + E = 14.40 \\ E = C + 2 \end{cases} \quad \begin{aligned} E &= 6.20 + 2 \\ E &= 8.20 \end{aligned}$$

$$\begin{aligned} C + (C + 2) &= 14.40 \\ 2C &= 12.40 \\ C &= 6.20 \end{aligned}$$

Carol's meal cost \$6.20  
Beth's meal cost \$8.20

6. In the school bookstore, four pencils and an eraser cost 65¢. Two pencils and an eraser cost 45¢. Find the cost of each item.

$$\begin{aligned} P &= \text{pencil cost} \\ E &= \text{eraser cost} \end{aligned} \quad \begin{cases} 4P + E = 0.65 \\ 2P + E = 0.45 \end{cases} \Rightarrow E = 0.65 - 4P$$

$$\begin{aligned} 2P + (0.65 - 4P) &= 0.45 \\ -2P + 0.65 &= 0.45 \\ -2P &= -0.20 \\ P &= 0.10 \end{aligned}$$

$$\begin{aligned} E &= 0.65 - 4(0.10) \\ E &= 0.65 - 0.40 \\ E &= 0.25 \end{aligned}$$

Eraser's cost \$0.25  
Pencil's cost \$0.10

7. At Clucker's Chicken, a bucket of 4 pieces of dark meat and 5 pieces of white meat costs \$7.05. A bucket of 3 pieces of dark meat and 8 pieces of white meat costs \$8.90. Find the cost of a piece of dark meat and a piece of white meat individually.

$$\begin{aligned} D &= \text{cost of dark meat} \\ W &= \text{cost of white meat} \end{aligned}$$

$$\begin{aligned} -3 \{ 4D + 5W = 7.05 \} &\Rightarrow -12D - 15W = -21.15 \\ 4 \{ 3D + 8W = 8.90 \} &\Rightarrow 12D + 32W = 35.60 \end{aligned}$$

$$\begin{aligned} 17W &= 14.45 \\ W &= 0.85 \end{aligned}$$

$$4D + 5(0.85) = 7.05$$

$$4D + 4.25 = 7.05$$

$$4D = 2.80$$

$$D = 0.70$$

a) White meat pieces cost \$0.85  
dark meat pieces cost \$0.70

### Problem-Solving: Systems using three Equations

1) The table below shows the percent of comedies, drama, and action videos available at a video store. Assume that the store has a collection of 3,405 general videos to be rented, 1,070 children's videos to be rented, and 1,225 videos for sale. Write and solve a system of equations to find out how many comedies, dramas, and action movies are at the store.

Store Section:	Comedy	Drama	Action
General rental	55%	65%	60%
Children's rental	25%	10%	20%
Videos for sale	20%	25%	20%

$C = \# \text{ comedies}$   
 $d = \# \text{ dramas}$   
 $a = \# \text{ action}$

$$\begin{cases} 1) 0.55c + 0.65d + 0.6a = 3405 \\ 2) 0.25c + 0.10d + 0.20a = 1070 \\ 3) 0.20c + 0.25d + 0.20a = 1225 \end{cases}$$

$$\begin{aligned} 4) (0.05c - 0.15d = -155) &\Rightarrow 0.20c - 0.60d = 620 \\ -0.20c + 0.35d = -195 &\quad -0.20c + 0.35d = -195 \\ \hline &\quad -0.25d = 425 \\ &\quad d = 1700 \end{aligned}$$

$$\begin{aligned} (2+3) \quad 0.25c + 0.10d + 0.20a &= 1070 \\ -0.20c + 0.25d - 0.20a &= -1225 \\ \hline 0.05c - 0.15d &= -155 \\ (1a+2) \quad 0.55c + 0.65d + 0.6a &= 3405 \\ -0.75c - 0.30d - 0.60a &= -3210 \\ \hline -0.20c + 0.35d &= 195 \end{aligned}$$

$$\begin{aligned} 0.05c - 0.15(1700) &= -155 \\ 0.05c - 255 &= -155 \\ 0.05c &= 100 \\ \frac{0.05c}{0.05} &= \frac{100}{0.05} \\ c &= 2000 \end{aligned}$$

$$\begin{aligned} 0.20(2000) + 0.25(1700) + 0.20a &= 1225 \\ 200 + 382.5 + 0.20a &= 1225 \\ 0.20a &= 442.5 \\ a &= 2212.5 \end{aligned}$$

Videos  
2000 comedy  
1700 drama  
2000 action

2) You have \$25 to spend on picking 21 pounds of three different types of apples in an orchard. The Empire apples cost \$1.40 a pound, the Red Delicious apples cost \$1.10 per pound, and the Golden Delicious apples cost \$1.30 per pound. You want to buy twice as many Red Delicious apples as the other two types combined. How many pounds of each apple should you buy using a system of equations?

$e = \text{empire}$   
 $r = \text{red delicious}$   
 $g = \text{golden delicious}$

$$\begin{aligned} 1.4e + 1.1r + 1.3g &= 25 \Rightarrow 1.4e + 1.1(2e+2g) + 1.3g = 25 \\ e + r + g &= 21 \\ r &= 2e + 2g \end{aligned}$$

$$\begin{aligned} 10(3.6e + 3.5g) &= 250 \\ -12(3e + 3g) &= -210 \\ \hline 36e + 35g &= 250 \\ -36e - 36g &= -252 \\ \hline -g &= -2 \\ g &= 2 \end{aligned}$$

$$\begin{aligned} r &= 2(5) + 2(2) \\ r &= 14 \end{aligned}$$

You should buy  
14 lbs red delicious  
2 lbs golden delicious  
5 lbs empire

$$\begin{aligned} 36e + 35(2) &= 250 \\ 36e + 70 &= 250 \\ 36e &= 180 \end{aligned}$$

3) Jambalaya is a Cajun dish made from chicken, sausage and rice. Simone is making a large pot of Jambalaya for a party. Chicken costs \$6 per pound, sausage costs \$3 per pound, and rice costs \$1 per pound. She spends \$42 on  $13\frac{1}{2}$  pounds of food. She buys twice as much rice as sausage.

$c$  = pounds of chicken  
 $s$  = pounds of sausage  
 $r$  = pounds of rice

a) Write a system of three equations that represents how much food Simone purchased.

$$r = 2s$$

$$\begin{cases} 6c + 3s + r = 42 \\ c + s + r = 13.5 \\ r = 2s \end{cases}$$

b) How much chicken, sausage, and rice will she use in her dish?

$$\begin{aligned} 6c + 3s + (2s) = 42 &\Rightarrow 6c + 5s = 42 \\ c + s + (2s) = 13.5 &\Rightarrow c + 3s = 13.5 \end{aligned}$$

$$\begin{aligned} 6c + 5s &= 42 \\ -6c - 18s &= -81 \\ \hline -13s &= -39 \\ s &= 3 \\ 6c + 5(3) &= 42 \\ 6c + 15 &= 42 \\ 6c &= 27 \\ c &= 4.5 \end{aligned}$$

$$\begin{aligned} 4.5 + 3 + r &= 13.5 \\ 7.5 + r &= 13.5 \\ r &= 6 \end{aligned}$$

She should use  
 6 lbs rice  
 4.5 lbs chicken  
 3 lbs sausage

4) The sum of three numbers is 20. The second number is four times the first and the sum of the first and third is eight. Find the numbers using a system of equations.

$a$  = 1st #  
 $b$  = 2nd #  
 $c$  = 3rd #

$$\begin{cases} a + b + c = 20 \\ b = 4a \\ a + c = 8 \end{cases} \Rightarrow \begin{aligned} a + (4a) + c &= 20 \Rightarrow 5a + c = 20 \\ a + c &= 8 \end{aligned}$$

$$\begin{aligned} 5a + c &= 20 \\ -5(a + c = 8) &\Rightarrow -5a - 5c = -40 \\ \hline -4c &= -20 \\ c &= 5 \end{aligned}$$

The three numbers are  
 3, 12 and 5

$$\begin{aligned} a + 5 &= 8 \\ a &= 3 \\ b &= 4(3) \\ b &= 12 \end{aligned}$$

5) The sum of three numbers is 12. The first number is twice the sum of the second and third. The third number is five less than the first. Find the numbers using a system of equations.

$a = \text{first \#}$   
 $b = \text{2nd \#}$   
 $c = \text{3rd \#}$

$$\begin{aligned} a + b + c &= 12 \\ a &= 2(b + c) \\ c &= a - 5 \end{aligned}$$

$$\begin{aligned} a + b + (a - 5) &= 12 \Rightarrow 2a + b = 17 \\ a &= 2(b + a - 5) \\ a &= 2b + 2a - 10 \\ a + 2b &= 10 \end{aligned}$$

$$\begin{aligned} 2a + b &= 17 \\ -2a - 4b &= -20 \\ \hline -3b &= -3 \\ b &= 1 \end{aligned}$$

$$\begin{aligned} c &= 8 - 5 \\ c &= 3 \\ a + 2(1) &= 10 \\ a &= 8 \end{aligned}$$

The three numbers are 8, 1, 3

6) Jonathan and members of his Spanish Club are going to Costa Rica over spring break. Before his trip, he purchases 10 travelers checks in denominations of \$20, \$50, and \$100, totaling \$370. He has twice as many \$20 checks as \$50 checks. How many of each type of denomination of travelers checks does he have? Use a system of equations to solve.

$t = \text{\# \$20 checks}$   
 $f = \text{\# \$50 checks}$   
 $h = \text{\# \$100 checks}$

$$\begin{aligned} 20t + 50f + 100h &= 370 \\ t + f + h &= 10 \\ t &= 2f \end{aligned}$$

$$\begin{aligned} 3f + h &= 10 \\ 3f + 10 &= 10 \\ 3f &= 0 \\ f &= 3 \\ t + 3 + 1 &= 10 \\ t &= 6 \end{aligned}$$

6 - \$20 checks  
 3 - \$50 checks  
 1 - \$100 checks

$$\begin{aligned} 20(2f) + 50f + 100h &= 370 \\ 2f + f + h &= 10 \\ 49f + 100h &= 370 \Rightarrow 90f + 100h = 370 \\ 30(3f + h = 10) &\Rightarrow -90f - 30h = -300 \\ \hline 70h &= 70 \Rightarrow h = 1 \end{aligned}$$

7) In the 2000-01 season, Minnesota's Katie Smith was ranked first in the WNBA for total points and three-point goals made. She scored 646 points making 355 shots, including three-point field goals, two-point field goals, and one-point free throws. She made 27 more two-point field goals than three-point field goals.

$s = \text{\# 3-pt shots}$   
 $t = \text{\# 2-pt shots}$   
 $o = \text{\# one pt shots}$

a) Write a system of three equations that represents the number of goals Katie Smith made.

$$\begin{aligned} t + o + n &= 355 \\ 3t + 2o + n &= 646 \\ o &= t + 27 \end{aligned}$$

$$\begin{aligned} t + (t + 27) + n &= 355 \\ 3t + 2(t + 27) + n &= 646 \\ \hline 2t + n &= 328 \\ -5t + n &= 392 \\ \hline -3t &= -264 \\ t &= 88 \end{aligned}$$

$$\begin{aligned} p &= 88 + 27 = 115 \\ p &= 115 \\ 88 + 115 + n &= 355 \\ n &= 152 \end{aligned}$$

b) Find the number of each type of goal she made.

She made  
 152 one-pt. shots  
 115 two-pt. shots  
 88 three-pt. shots

# Extra Practice

# 7.4

Name \_\_\_\_\_

9 right hand  
3 left hand

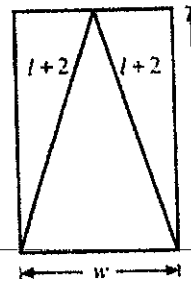
1 chicken dinner  
5 steak dinners

- Baseball Glove Sales** A sporting goods store sells right-handed and left-handed baseball gloves. In one month, 12 gloves were sold for a total revenue of \$561. Right-handed gloves cost \$45 and left-handed gloves cost \$52. How many of each type of glove did they sell?
- Southern Cuisine** Your family goes to a Southern-style restaurant for dinner. There are 6 people in your family. Some people order the chicken dinner for \$14 and some order the steak dinner for \$17. If the total bill was \$99, how many people ordered each dinner?

- Cookout** You are buying the meat for a cookout. You need to buy 8 packages of meat. A package of hotdogs costs \$1.60 and a package of hamburger costs \$5.00. If you spend a total of \$23.00, how many packages of each can you buy?

5 pkgs hot dogs  
3 pkgs burger

- Dimensions of a Rectangle** The perimeter of the rectangle below is 20 in. The perimeter of the inscribed triangle is 20 in. Find the dimensions of the rectangle.



width = 4  
length = 6

3 hours in PA  
2 hours in OH

- Driving to Grandma's House** You live in Pennsylvania and your grandparents live in Ohio. When you are in Pennsylvania, you drive an average rate of 55 mph. When you are in Ohio, you drive an average rate of 65 mph. The entire trip of 295 miles takes 5 hours. How long does it take to reach the Pennsylvania-Ohio border? How long does it take to get from the border to your grandparents' house?

- Election Polls** According to a local survey performed in January, 55% of the people polled said they would reelect the town's mayor. However, the mayor's percentage of votes decreased 2% each month. The survey revealed that 30% of the people polled would vote for the challenger. The challenger's percentage of votes increased 3% each month. In what month will the percentage of people willing to vote for the challenger equal that of the mayor? What percentage will vote for the challenger in that month?

in month 5 (June)  
45% will vote for challenger

**Shipping Costs** In 7-10, use the following information.

The flat rate plus the rate per mile that two shipping companies charge to make an 800-pound delivery are listed in the matrix below.

(Dollars)	Flat Rate	Rate/mile
Company A	100	0.30
Company B	200	0.10

did in class

- Find a linear system that describes the cost of shipping with each company.
- How far must a delivery go for both companies to charge the same amount?
- Which company is more economical if the delivery is closer than the distance found in Exercise 8?
- Which company is more economical if the delivery is sent further than the distance found in Exercise 8?