

## 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?

Define variables:

$a$  = adult tickets  
 $c$  = children tickets

System of equations:

$$\begin{aligned} 6a + 4c &= 104 \\ a + c &= 21 \end{aligned}$$

State your solution:

11 children tickets  
 10 adult tickets.

Solve the system showing all steps

$$\begin{aligned} 6a + 4c &= 104 \\ -6(a + c &= 21) \\ \hline & \\ 6a + 4c &= 104 \\ -6a - 6c &= -126 \\ \hline -2c &= -22 \\ \frac{-2c}{-2} &= \frac{-22}{-2} \\ c &= 11 \\ a + c &= 21 \Rightarrow a + (11) = 21 \end{aligned}$$

$$\frac{1.2}{2.5} = \frac{2}{4}$$

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?

Define variables:

$C$  = chicken  
 $S$  = steak

System of equations:

$$\begin{aligned} 14.80c + 17s &= 91 \\ c + s &= 6 \end{aligned}$$

State your solution:

5 chicken dinners  
 1 steak dinner.

Solve the system showing all steps

$$\begin{aligned} 14.80c + 17s &= 91 \\ -17(c + s &= 6) \\ \hline & \\ 14.80c + 17s &= 91 \\ -17c - 17s &= -102 \\ \hline -2.2c &= -11 \\ \frac{-2.2c}{-2.2} &= \frac{-11}{-2.2} \\ c &= 5 \end{aligned}$$

# System of Equation Word Problems

## 4-Step Method:

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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?

Define variables:

$d = \text{dogs}$   
 $h = \text{hamburgers}$

System of equations:

$$\begin{aligned} 1.6d + 5h &= 23 \\ d + h &= 8 \end{aligned}$$

State your solution:

3 packages of  
hamburgers were  
sold.

Solve the system showing all steps

$$\begin{aligned} 1.6d + 5h &= 23 \\ -1.6(d + h &= 8) \\ \hline 1.6d + 5h &= 23 \\ -1.6d - 1.6h &= -12.8 \\ \hline 3.4h &= 10.2 \\ 3.4 & \quad 3.4 \\ \hline h &= 3 \end{aligned}$$

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?

Define variables:

$p = \text{pizza}$   
 $b = \text{bread sticks}$

System of equations:

$$\begin{aligned} 3p + 2b &= 29.50 \\ 2p + 3b &= 23 \end{aligned}$$

State your solution:

The price of a  
pizza is \$8.50

Solve the system showing all steps

$$\begin{aligned} 3(3p + 2b &= 29.5) \\ -2(2p + 3b &= 23) \\ \hline 9p + 6b &= 88.5 \\ -4p - 6b &= -46 \\ \hline 5p &= 42.5 \\ 5 & \quad 5 \\ \hline p &= 8.5 \end{aligned}$$

$$\begin{array}{r|l} 2 & 3 \\ 2 & 3 \\ 4 & 6 \\ 6 & 9 \\ 8 & 12 \\ 10 & 15 \\ \vdots & \vdots \end{array}$$



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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?

Define variables:

$d = \text{day}$   
 $m = \text{miles}$

System of equations:

$$\begin{aligned} 6d + 550m &= 337 \\ 3d + 350m &= 185 \end{aligned}$$

State your solution:

\$36 per day  
.22 per mile

Solve the system showing all steps

$$\begin{aligned} 6d + 550m &= 337 \\ -2(3d + 350m &= 185) \end{aligned}$$

Rewrite:

$$\begin{aligned} 6d + 550m &= 337 \\ -6d - 700m &= -370 \\ \hline -150m &= -33 \\ -150 & \quad -150 \\ \hline m &= .22 \end{aligned}$$

$$\begin{aligned} 3d + 350(.22) &= 185 \\ 3d + 77 &= 185 \\ 3d &= 108 \\ d &= 36 \end{aligned}$$

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?

Define variables:

$n = \text{night}$   
 $m = \text{meal}$

System of equations:

$$\begin{aligned} 2n + 3m &= 195 \\ 3n + 5m &= 300 \end{aligned}$$

State your solution:

meal costs  
\$15

Solve the system showing all steps

$$\begin{aligned} -3(2n + 3m &= 195) \\ 2(3n + 5m &= 300) \end{aligned}$$

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

## System of Equation Word Problems

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1.) 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?

Define variables:

System of equations:

State your solution:

Solve the system showing all steps

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2.) 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.

Define variables:

$S$  = sugar  
 $f$  = flour

System of equations:

$$\begin{aligned} 15f + 12S &= 9.30 \\ 10f + 4S &= 4.60 \end{aligned}$$

State your solution:

sugar is 40¢  
flour is 30¢

Solve the system showing all steps

$$\begin{aligned} 15f + 12S &= 9.30 \\ -3(10f + 4S &= 4.6) \\ \hline \text{LCM: } 12 \quad 4 \\ 12 \quad 4 \\ 24 \quad 8 \\ \hline 12 \end{aligned}$$

Rewrite:

$$\begin{aligned} 15f + 12S &= 9.30 \\ -30f - 12S &= -13.80 \\ \hline -15f &= -4.5 \\ \hline f &= .3 \end{aligned}$$

Plug in .3 for  $f$

$$\begin{aligned} 10(.3) + 4S &= 4.6 \\ 3 + 4S &= 4.6 \\ 4S &= 1.6 \\ S &= .4 \end{aligned}$$

continued:  
 $4S = 1.6$   
 $S = .4$



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3.) 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?

Define variables:  
 $b$  = pair of baseball tickets  
 $n$  = nights

System of equations:  
 $3n + 2b = 645$   
 $5n + 4b = 1135$

State your solution:  
 baseball ticket pair is \$90. single night cost 155.

Solve the system showing all steps

$$\begin{array}{r} -2(3n + 2b = 645) \\ 5n + 4b = 1135 \end{array}$$

Rewrite:

$$\begin{array}{r} -6n - 4b = -1290 \\ + 5n + 4b = 1135 \\ \hline -n = -155 \end{array}$$

plug  $n=155$

$$\begin{array}{r} 3(155) + 2b = 645 \\ 465 + 2b = 645 \\ 2b = 180 \\ b = 90 \end{array}$$

4.) 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?

Define variables:  
 $b$  = balcony  
 $k$  = orchestra

System of equations:  
 $b + k = 600$   
 $5b + 10k = 4750$

State your solution:  
 250 balcony tickets,  
 350 orchestra tickets.

Solve the system showing all steps

$$\begin{array}{r} 5b + 10k = 4750 \\ -5(b + k = 600) \end{array}$$

Rewrite:

$$\begin{array}{r} 5b + 10k = 4750 \\ + -5b - 5k = -3000 \\ \hline 5k = 1750 \end{array}$$

$$5k = 1750$$

$$k = 350$$

$$\begin{array}{r} b + (350) = 600 \\ b = 250 \end{array}$$

## System of Equation Word Problems

### 4-Step Method:

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5.) 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?

Define variables:

$$w = \text{wool}$$

$$c = \text{cotton}$$

System of equations:

$$w + c = 5$$

$$5w + 3c = 19$$

State your solution:

2 of wool,  
3 of cotton.

Solve the system showing all steps

$$5w + 3c = 19$$

$$-5(w + c = 5)$$

Rewrite:

$$5w + 3c = 19$$

$$-5w - 5c = -25$$


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$$-2c = -6$$

$$c = 3$$

$$w + (3) = 5$$

$$w = 2$$

6.) 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?

Define variables:

$$R = \text{right}$$

$$L = \text{left}$$

System of equations:

$$R + L = 12$$

$$48R + 36L = 528$$

State your solution:

4 left  
8 right.

Solve the system showing all steps

$$48R + 36L = 528$$

$$-48(R + L = 12)$$

Rewrite:

$$48R + 36L = 528$$

$$-48R - 48L = 576$$


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$$-12L = -48$$

$$-12L = -48$$

$$L = 4$$

$$R + (4) = 12$$

$$R = 8$$