

# Systems of Equations: Lesson 6

## Word Problems 2: Worksheet

Name: Answers



With the wind, a plane flew at an actual speed of 515 mph. Against the wind current, it flew at 435 mph. What is the airplane's speed and the wind speed?

$$\begin{array}{r} a+w=515 \\ a-w=435 \\ \hline \end{array}$$

$$2a=950$$

$$a=475 \text{ mph}$$

$$\begin{array}{r} a+w=515 \\ 475+w=515 \end{array}$$

$$w=40 \text{ mph}$$

A restaurant costs \$2,400 per month to operate. It pays an average of \$5 for each meal. The average selling price of each meal is \$26. How many meals does it need to sell in a month to break even?

Expenses:

$$\$2400 + \$5m$$

$m = \# \text{ meals}$

Income:

$$\$26m$$

$$2400 + 5m = 26m$$

$$2400 = 21m$$

$$m \approx 114.29$$

They need to sell 115 meals per month to break even.

I invested \$5,000 into 2 accounts, one earning 8% interest and the other earning 10%. I earned \$475 in total interest. How much money did I put into each account?

amt in 8%:  $x$   
amt in 10%:  $y$

8%: \$1250  
10%: \$3750

$$\begin{aligned} x &= 5000 - y \\ x + y &= 5000 \\ .08x + .10y &= 475 \\ .08(5000 - y) + .10y &= 475 \\ 400 - .08y + .10y &= 475 \\ 400 + .02y &= 475 \\ .02y &= 75 \\ y &= 3750 \end{aligned}$$

$$\begin{aligned} x &= 5000 - y \\ x &= 5000 - 3750 = \\ &= \$1250 \end{aligned}$$

### Challenge:

A lemonade is 20% sugar. Another lemonade is 12% sugar. How many ounces of each solution should be combined to make 15 oz. of lemonade at 18% sugar?

#### 1) Percents

(percent · amount of it):  $.20 \cdot x + .12 \cdot y = .18 \cdot (15)$

#### 2) Amount

$$x + y = 15 \text{ oz}$$

$$x = 15 - y$$

$$.20(15 - y) + .12y = 2.7$$

$$3 - .2y + .12y = 2.7$$

$$3 - 0.08y = 2.7$$

$$-0.08y = -.3$$

$$x = 15 - y$$

$$x = 15 - 3.75$$

$$x = 11.25 \text{ oz}$$

$$y = 3.75 \text{ oz}$$

You should use 11.25 oz of the 20% sugar and 3.75 oz of the 12% sugar to make 15 oz of 18% sugar lemonade.