

A decorative background featuring a light gray gradient with several realistic water droplets of various sizes scattered across the surface. The droplets have highlights and shadows, giving them a three-dimensional appearance.

# Systems Applications

- The sum of a certain number and a second number is  $-42$ .  
 The first number minus the second is  $52$ . Find the numbers.

$$X = 1^{\text{st}} \#$$

$$y = 2^{\text{nd}} \#$$

$$X + y = -42$$

$$X - y = 52$$

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$$2x = 10$$

$$x = 5$$

$$5 + y = -42$$

$$y = -47$$

① Read

② Identify what we are looking for

③ Set up the equations

④ Solve

Soybean meal is 16% protein and corn meal is 9% protein. How many pounds of each should be mixed together to get a 350-lb mixture that is 12% protein?

$$R \cdot t = D$$

A train leaves a station and travels north at 75 MPH. Two hours later a second train leaves on a parallel track and travels north at 125 MPH. How long will it be before the 2nd train passes the first train?

Time	R	T	D
Train 1	75	x	y
Train 2	125	x-2	y

$$75x = y$$

$$125(x-2) = y$$

$$75x = 125(x-2)$$

$$75x = 125x - 250$$

$$x = 5 \text{ hours}$$

Train 1

$$\frac{x-2}{5-2} = 3 \text{ hours}$$

- Two motorcycles travel toward each other from Chicago and Indianapolis, which are about 350 km apart, at rates of 110 and 90 km/h. They started at the same time. In how many hours will they meet?

Carlos is 8 years older than his sister Maria. Four years ago Maria was two-thirds as old as Carlos. How old are they now?

$X = \text{Carlos' age now}$   
 $y = \text{Maria's age now}$

$$X = 8 + y \quad 20$$

$$y - 4 = \frac{2}{3}(X - 4) \quad 28$$

$$y - 4 = \frac{2}{3}(8 + y - 4)$$

$$(y - 4 = \frac{2}{3}y + \frac{8}{3}) \approx$$

$$3y - 12 = 2y + 8$$

$$-2y$$

$$y - 12 = 8$$

$$+12$$

$$y = 20$$

The sum of the digits of a two-digit number is 5. If the digits are reversed, the new number is 27 more than the original number. Find the original number.

(2 digits)

$$x = 1^{\text{st}} \text{ digit}$$
$$y = 2^{\text{nd}} \text{ digit}$$

$$\text{orig \#}$$
$$10x + y$$

$$\underline{\underline{56}}$$
$$10 \cdot 5 + 6$$

$$x + y = 5$$

$$10y + x = 10x + y + 27$$