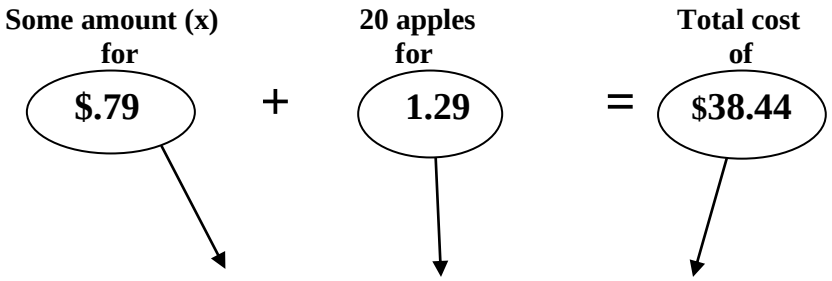
Mixture Word Problems

MIXING TWO TYPES OF ITEMS
USING 1 VARIABLE

Holly bought apples that were at two different prices. She bought 20 apples at $1.29 each, some other apples for $.79 each, and her total bill was $38.44. How many apples did she buy for $.79 each?



$$(x)(.79) + (20)(1.29) = \$38.44$$

$$\begin{aligned} .79x + 25.80 &= \$38.44 \\ \underline{-\ 25.80} &= \underline{-\ 25.80} \\ .79x &= 12.64 \end{aligned}$$

$$\frac{.79x}{.79} = \frac{12.64}{.79}$$

$$x = 16$$

So, Holly bought 16 apples that cost .79 each.

Mixture Word Problems

MIXTURE OF TWO SOLUTIONS USING 2 VARIABLES

How many liters of a 12% saline solution should be mixed with how many liters of a 30% saline solution to get 18 liters of a 20% saline solution? ('Of' means multiply by.)

Equation 1: (Using both liter amounts and percentages)

x liters of 12% saline	+	**y liters of** 30% saline	=	**18 liters of** 20% saline

Equation 2: (Using liters only)

x liters + y liters = 18 liters

It's a system of equations:

x(.12)	**+**	**y(.30)**	**=**	**18(.20)**
x	**+**	**y**	**=**	**18**

Use Elimination:

$$\begin{array}{rcrcr} .12x & + & .30y & = & 3.6 \\ x & + & y & = & 18 \end{array}$$

Multiply by: 100 → ; -12 →

$$\begin{array}{rcrcr} 12x & + & 30y & = & 360 \\ -12x & - & 12y & = & -216 \\ \hline 0 & + & 18y & = & 144 \\ & & \frac{18}{} & & \frac{18}{} \end{array}$$

$$y = 8$$

Plug 8 in for y to find x.

$$x + y = 18$$
$$x + (8) = 18$$
$$x = 10$$

Answer: 8 liters of 30% saline solution and 10 liters of 12% saline solution