

Mixture Problems

Example: The instructions on a can of powdered drink mix say to mix $\frac{1}{4}$ cup of the mix with 2 quarts of water. How much of the mix should be used with $1\frac{1}{2}$ gallons of water?

Let x = # of cups of the drink mix to use

$$\frac{\frac{1}{4}}{2} = \frac{x}{6} \quad \leftarrow \text{There are 6 quarts in } 1\frac{1}{2} \text{ gallons}$$

$$6\left(\frac{1}{4}\right) = 2x$$

$$\frac{3}{2} = 2x$$

$$x = \frac{3}{4} \text{ cup of the drink mix}$$

Number Problems

Example: Find a number such that 5 more than one-half the number is three times the number.

Translating into math: $5 + \frac{x}{2} = 3x$ ← let x be the unknown number.

Solving:

$$2\left(5 + \frac{x}{2}\right) = 2(3x) \rightarrow \begin{aligned} 10 + x &= 6x \\ 10 &= 5x \\ x &= 2 \end{aligned}$$

Percent of Problems

Example: The price of gasoline increased by 25% between January and March. If the price per gallon in March was \$1.15, what was the price per gallon in January?

To find the price in March: Price in January + 25% increase in cost = Price in March

Let: price per gallon in January = x
25% increase in cost = $0.25x$
price in March = 1.15

$$\text{Then } x + 0.25x = 1.15$$

$$1.25x = 1.15$$

$$x = \$0.92$$