System of Equations (Word Problems)

1. The sum of the measures of angles x and y is $127°$. If the measure of $\angle x$ is $34°$ more than half the measure of $\angle y$, what is the measure of each angle?

2. Small boxes contain DVDs, and large boxes contain one gaming machine. Three boxes of gaming machines and a box of DVDs weigh 48 pounds. Three boxes of gaming machines and five boxes of DVDs weigh 72 pounds. How much does each box weigh?

System of Equations (Word Problems)

1. The sum of the measures of angles x and y is $127°$. If the measure of $\angle x$ is $34°$ more than half the measure of $\angle y$, what is the measure of each angle?

Let x represent the measure of $\angle x$ and y represent the measure of $\angle y$. Then:

$$\begin{cases} x + y = 127 \\ x = 34 + \dfrac{1}{2}y \end{cases}$$

$$34 + \frac{1}{2}y + y = 127$$

$$34 + \frac{3}{2}y = 127$$

$$\frac{3}{2}y = 93$$

$$y = 62$$

$$x + 62 = 127$$

$$x = 65$$

The solution is $(65, 62)$.

$$65 = 34 + \frac{1}{2}(62)$$

$$65 = 34 + 31$$

$$65 = 65$$

The measure of $\angle x$ is $65°$, and the measure of $\angle y$ is $62°$.

2. Small boxes contain DVDs, and large boxes contain one gaming machine. Three boxes of gaming machines and a box of DVDs weigh 48 pounds. Three boxes of gaming machines and five boxes of DVDs weigh 72 pounds. How much does each box weigh?

Let x represent the weight of the gaming machine box, and let y represent the weight of the DVD box. Then:

$$\begin{cases} 3x + y = 48 \\ 3x + 5y = 72 \end{cases}$$

$$-1(3x + y = 48)$$

$$-3x - y = -48$$

$$\begin{cases} -3x - y = -48 \\ 3x + 5y = 72 \end{cases}$$

$$3x - 3x + 5y - y = 72 - 48$$

$$4y = 24$$

$$y = 6$$

$$3x + 6 = 48$$

$$3x = 42$$

$$x = 14 \quad \text{The solution is } (14, 6).$$

$$3(14) + 5(6) = 72$$

$$72 = 72$$

The box with one gaming machine weighs 14 pounds, and the box containing DVDs weighs 6 pounds.

Go to onlinemathlearning.com for more free math resources