

## System of Equations (Word Problems)

1. The sum of the ages of two brothers is 46. The younger brother is 10 more than a third of the older brother's age. How old is the younger brother?

2. One angle measures 54 more degrees than 3 times another angle. The angles are supplementary. What are their measures?

## System of Equations (Word Problems)

1. The sum of the ages of two brothers is 46. The younger brother is 10 more than a third of the older brother's age. How old is the younger brother?

*Let  $x$  represent the age of the younger brother and  $y$  represent the age of the older brother.*

$$\begin{cases} x + y = 46 \\ x = 10 + \frac{1}{3}y \end{cases}$$

$$10 + \frac{1}{3}y + y = 46$$

$$10 + \frac{4}{3}y = 46$$

$$\frac{4}{3}y = 36$$

$$y = 27$$

$$x + 27 = 46$$

$$x = 19$$

*The solution is (19, 27).*

$$19 = 10 + \frac{1}{3}(27)$$

$$19 = 10 + 9$$

$$19 = 19$$

*The younger brother is 19 years old.*

2. One angle measures 54 more degrees than 3 times another angle. The angles are supplementary. What are their measures?

*Let  $x$  represent the measure of one angle and  $y$  represent the measure of the other angle.*

$$\begin{cases} x = 3y + 54 \\ x + y = 180 \end{cases}$$

$$3y + 54 + y = 180$$

$$4y + 54 = 180$$

$$4y = 126$$

$$y = 31.5$$

$$x = 3(31.5) + 54$$

$$x = 94.5 + 54$$

$$x = 148.5$$

*The solution is (148.5, 31.5).*

$$148.5 + 31.5 = 180$$

$$180 = 180$$

*One angle measures 148.5°, and the other measures 31.5°.*