## Questions

**1.** Solve for $x$ if $-12 + x - 3 = 15 - 18 + 9$.

**2.** Solve for $x$ if $-19 + x - 7 = 20 - 42 + 10$.

**3.** Is $x = 5$ the solution to $-7 + x = 2$? If not, find the correct solution.

**4.** Is $x = -8$ the solution to $-39 = x - 47$? If not, find the correct solution.

**5.** Find the value of $x$ that satisfies $\dfrac{2}{3} + x = \dfrac{1}{6} + \dfrac{1}{4}$.

**6.** Find the value of $x$ that satisfies $\dfrac{5}{12} - \dfrac{5}{6} = x - \dfrac{3}{2}$.

**7.** The Perception Toy Company wishes to cut costs and decides that improving quality control will help. It can do this by reducing the amount of rejected frisbees to 3%. In a recent week, a quality inspector found that 8 out of 413 frisbees were rejected. Did they meet the goal?

**8.** A 90 meter wide radar picture is taken of a swamp in Australia. The radar detects a rock outcrop that is 90 feet above sea level, and a vein of opal (a semi-precious stone) that is 27 feet below sea level. How far is the top of the rock from the location of the opal?

**9.** Trevor pays his monthly computer lease bill for $49.99 but forgets to look at his checking account balance before doing so. When he gets his account statement at the local ATM, his balance reads $-\$35.07$. How much was in the account before he wrote the check?

## Solutions

**1.**

$$-12 + x - 3 = 15 - 18 + 9$$
$$x - 15 = 6 \text{ simplify each side by adding the numbers}$$
$$x - 15 + 15 = 6 + 15 \text{ add 15 to both sides of the equation}$$
$$x = 21 \text{ simplify}$$

**2.**

$$-19 + x - 7 = 20 - 42 + 10$$
$$x - 26 = -12$$
$$x - 26 + 26 = -12 + 26$$
$$x = 14$$

**3.** Check if $x = 5$ is a solution by substitution:

$$-7 + (5) = 2$$
$$-2 = 2 \text{ False, so } x = 5 \text{ is not a solution.}$$

Get correct solution:

$$-7 + x = 2$$
$$-7 + x + 7 = 2 + 7$$
$$x = 9$$

**4.** Check if $x = -8$ is a solution by substitution:

$$-39 = (-8) - 47$$
$$-39 = -55 \text{ False, so } x = -8 \text{ is not a solution.}$$

Get correct solution:

$$-39 = x - 47$$
$$-39 + 47 = x - 47 + 47$$
$$8 = x$$

**5.**

$$\frac{2}{3} + x = \frac{1}{6} + \frac{1}{4}$$
$$\frac{2}{3} + x = \frac{2}{12} + \frac{3}{12}$$
$$\frac{2}{3} + x = \frac{5}{12}$$
$$\frac{2}{3} + x - \frac{2}{3} = \frac{5}{12} - \frac{2}{3}$$
$$x = \frac{5}{12} - \frac{8}{12}$$
$$x = \frac{-3}{12} = -\frac{1}{4}$$

**6.**

$$\frac{5}{12} - \frac{5}{6} = x - \frac{3}{2}$$
$$\frac{5}{12} - \frac{10}{12} = x - \frac{3}{2}$$
$$-\frac{5}{12} = x - \frac{3}{2}$$
$$-\frac{5}{12} + \frac{3}{2} = x - \frac{3}{2} + \frac{3}{2}$$
$$-\frac{5}{12} + \frac{18}{12} = x$$
$$\frac{13}{12} = x$$

**7.** $\dfrac{8}{413} = 0.019 = 1.9\% < 3\%$, so they met their goal.

**8.** The total distance is $90 - (-27) = 117$ feet.

**9.** Let $x$ be the amount of money in the account before Trev pays his bill.

$$x - \$49.99 = -\$35.07$$
$$x - \$49.99 + \$49.99 = -\$35.07 + \$49.99$$
$$x = \$14.92$$