Questions

1. Solve for x when $8x = 48 + 2x$.

2. Solve for x when $5x = 22 + 3x$.

3. Solve for x when $-6x = -27 + 3x$.

4. Solve for x when $72 - 4x = -12x$.

5. Solve for x when $9x - 5 = 7x + 43$.

6. Solve for x when $6(3x + 2) - 8 = -2$.

7. Solve for x when $7x - 3(5 - x) = 10$.

8. Solve for x when $5(x - 3) + 5 = 3(x + 2)$.

9. Solve for x when $3(2z - 4) - 4(z + 5) = 6$.

Solutions

1.

$$\begin{aligned} 8x &= 48 + 2x \\ 8x - 2x &= 48 + 2x - 2x \\ 6x &= 48 \\ \frac{1}{6} \cdot 6x &= \frac{1}{6} \cdot 48 \\ x &= 8 \end{aligned}$$

2.

$$\begin{aligned} 5x &= 22 + 3x \\ 5x - 3x &= 22 + 3x - 3x \\ 2x &= 22 \\ \frac{1}{2} \cdot 2x &= \frac{1}{2} \cdot 22 \\ x &= 11 \end{aligned}$$

3.

$$\begin{aligned} -6x &= -27 + 3x \\ -6x - 3x &= -27 + 3x - 3x \\ -9x &= -27 \\ \frac{1}{-9} \cdot (-9x) &= \frac{1}{-9} \cdot (-27) \\ x &= 3 \end{aligned}$$

4.

$$\begin{aligned} 72 - 4x &= -12x \\ 72 - 4x + 4x &= -12x + 4x \\ 72 &= -8x \\ \frac{1}{-8} \cdot (72) &= \frac{1}{-8} \cdot (-8x) \\ -9 &= x \end{aligned}$$

5.

$$\begin{aligned} 9x - 5 &= 7x + 43 \\ 9x - 5 + 5 - 7x &= 7x + 43 + 5 - 7x \\ 2x &= 48 \\ \frac{1}{2} \cdot (2x) &= \frac{1}{2} \cdot (48) \\ x &= 24 \end{aligned}$$

6.

$$\begin{aligned} 6(3x + 2) - 8 &= -2 \\ 18x + 12 - 8 &= -2 \text{ distribute} \\ 18x + 4 &= -2 \text{ simplify} \\ 18x + 4 - 4 &= -2 - 4 \text{ addition principle} \\ 18x &= -6 \text{ simplify} \\ \frac{1}{18} \cdot (18x) &= \frac{1}{18} \cdot (-6) \text{ multiplication principle} \\ x &= -\frac{1}{3} \text{ simplify} \end{aligned}$$

7.

$$\begin{aligned} 7x - 3(5 - x) &= 10 \\ 7x - 15 + 3x &= 10 \\ 10x - 15 &= 10 \\ 10x - 15 + 15 &= 10 + 15 \\ 10x &= 25 \\ \frac{1}{10} \cdot (10x) &= \frac{1}{10} \cdot (25) \\ x &= \frac{5}{2} \end{aligned}$$

8.

$$\begin{aligned} 5(x - 3) + 5 &= 3(x + 2) \\ 5x - 15 + 5 &= 3x + 6 \\ 5x - 10 &= 3x + 6 \\ 5x - 10 - 3x + 10 &= 3x + 6 - 3x + 10 \\ 2x &= 16 \\ \frac{1}{2} \cdot 2x &= \frac{1}{2} \cdot 16 \\ x &= 8 \end{aligned}$$

9.

$$\begin{aligned} 3(2z - 4) - 4(z + 5) &= 6 \\ 6z - 12 - 4z - 20 &= 6 \\ 2z - 32 &= 6 \\ 2z - 32 + 32 &= 6 + 32 \\ 2z &= 38 \\ \frac{1}{2} \cdot 2z &= \frac{1}{2} \cdot 38 \\ z &= 19 \end{aligned}$$