

Extra Practice: (5.4) Equations with Variables on Both Sides

Pre-Algebra

Name \_\_\_\_\_

Key

Solve each equation.

1)  $-22 + 4m + 5 - 12m = 1 - 7m - 8$

$$\begin{aligned} -17 - 8m + 8m &= -7m - 7 + 8m \\ -17 + 7 &= 1m - 7 + 7 \end{aligned}$$

$$\boxed{-10 = m}$$

2)  $2p + 11p = 9p - 20$

$$\begin{aligned} 13p - 9p &= 9p - 20 - 9p \\ 4p &= -20 \end{aligned}$$

$$\boxed{p = -5}$$

3)  $6p + 6p - 8 = 1 + 11p$

$$\begin{aligned} -11p + 12p - 8 &= 1 + 11p - 11p \\ p - 8 + 8 &= 1 + 8 \end{aligned}$$

$$\boxed{p = 9}$$

4)  $7 - 8k = 4 - 7k$

$$\begin{aligned} 7 - 8k + 8k &= 4 - 7k + 8k \\ 7 - 4 &= 4 + k - 4 \end{aligned}$$

$$\boxed{3 = k}$$

5)  $-10 - 6(7x - 7) = 8x - 18$

$$\begin{aligned} -10 - 42x + 42 &= 8x - 18 \\ 32 - 42x - 32 &= 8x - 18 - 32 \\ -42x - 8x &= 8x - 50 - 8x \\ -50x &= -50 \end{aligned}$$

$$\boxed{x = 1}$$

6)  $-2 - 8x = 7(5x + 12)$

$$\begin{aligned} -2 - 8x + 8x &= 35x + 84 + 8x \\ -2 - 84 &= 43x + 84 - 84 \\ -86 &= 43x \end{aligned}$$

$$\boxed{-2 = x}$$

7)  $37 + p = -6(4p - 2)$

$$\begin{aligned} 37 + p - 37 &= -24p + 12 - 37 \\ p + 24p &= -24p - 25 + 24p \\ 25p &= -25 \end{aligned}$$

$$\boxed{p = -1}$$

8)  $7(b + 9) = 47 + 9b$

$$\begin{aligned} 7b + 63 - 7b &= 47 + 9b - 7b \\ 63 - 47 &= 47 + 2b - 47 \\ 16 &= 2b \end{aligned}$$

$$\boxed{8 = b}$$

9)  $-7(12 - 7v) = 8(7v - 7)$

$$\begin{aligned} -49v - 84 + 49v &= 56v - 56 - 49v \\ -84 + 56 &= 7v - 56 + 56 \\ -28 &= 7v \end{aligned}$$

$$\boxed{-4 = v}$$

10)  $12n + 5(4n - 6) = -8(1 - 4n)$

$$\begin{aligned} 12n + 20n - 30 &= -8 + 32n \\ 32n - 30 &= 32n - 8 \end{aligned}$$

**No Solutions**

11)  $2(1 - r) = 11r + 2(-3r - 6)$

$$\begin{aligned} 2 - 2r &= 11r - 6r - 12 \\ 2 - 2r + 2r &= 5r - 12 + 2r \\ 2 + 12 &= 7r - 12 + 12 \end{aligned}$$

$$\begin{aligned} 14 &= 7r \\ \boxed{2 = r} \end{aligned}$$

12)  $-10(x + 9) = -4(7x - 9)$

$$\begin{aligned} -10x - 90 + 28x &= -28x + 36 + 28x \\ 18x - 90 + 90 &= 36 + 90 \\ 18x &= 126 \end{aligned}$$

$$\boxed{x = 7}$$