

2.2 Solve Equations

PRACTICE

+

Directions: For each solution to the equations below justify each step with the given property.

1) $2 + m + 7 = -11 + 5m$
 $2 + 7 + m = -11 + 5m$ Commutative Prop
 $9 + m = -11 + 5m$ Combine Like Terms
 $20 + m = 5m$ Additive Prop of Eq
 $20 = 4m$ Subtraction Prop of Eq
 $5 = m$ Division Prop of Eq
 {5}

2) $7 + 3v = -8 + 6v$
 $7 - 3v = -8$ Subtraction Prop of Eq
 $-3v = -15$ Subtraction Prop of Eq
 $v = 5$ Division Prop of Eq
 {5}

3) $-156 = -6(-7m + 5)$
 $-156 = 42m - 30$ Distributive Prop
 $-126 = 42m$ Additive Prop of Eq
 $-3 = m$ Division Prop of Eq
 {-3}

4) $3(1 - 6x) - 3(1 + 2x) = 0$
 $3 - 18x - 3 - 6x = 0$ Distributive Prop of Eq
 $3 - 3 - 18x - 6x = 0$ Commutative Prop
 $-24x = 0$ Combine Like Terms
 $x = 0$ Division Prop of Equality
 {0}

Directions: Solve each equation. Put your solution into set notation.

5) $15 + n - 6n = 7n + 3n$
 $15 - 5n = 10n$
 $\begin{array}{r} 15 - 5n = 10n \\ +5n \quad +5n \\ \hline 15 = 15n \\ \frac{15}{15} = \frac{15n}{15} \\ 1 = n \end{array}$
 {1}

6) $\frac{-9+n}{13} + 10 = 8$
 $\begin{array}{r} \frac{-9+n}{13} + 10 = 8 \\ -10 \quad -10 \\ \hline 3\left(\frac{-9+n}{13}\right) = -2(13) \\ -9+n = -26 \\ +9 \quad +9 \\ \hline n = -17 \end{array}$
 {-17}

7) $240 = -8(-5v + 5)$
 $240 = 40v - 40$
 $\begin{array}{r} 240 = 40v - 40 \\ +40 \quad +40 \\ \hline 280 = 40v \\ \frac{280}{40} = \frac{40v}{40} \\ 7 = v \end{array}$
 {7}

8) $-(8 + 7x) - 8(1 + x) = 74$
 $-8 - 7x - 8 - 8x = 74$
 $-8 - 8 - 7x - 8x = 74$
 $-16 - 15x = 74$
 $\begin{array}{r} -16 - 15x = 74 \\ +16 \quad +16 \\ \hline -15x = 90 \\ \frac{-15x}{-15} = \frac{90}{-15} \\ x = -6 \end{array}$
 {-6}

$$9) -1 = \frac{r-1}{2} - 5$$

$$\begin{array}{r} +5 \\ \hline 2(4) = \frac{r-1}{2} \end{array}$$

$$8 = r - 1$$

$$9 = r$$

$$\{9\}$$

$$10) 4x + 9 = x + 3 + 3x$$

$$\begin{array}{r} 4x + 9 = x + 3 + 3x \\ 4x + 9 = 4x + 3 \\ -4x \quad -4x \\ \hline 9 = 3 \end{array}$$

NO SOLUTION

$$\{ \}$$

$$11) \frac{1+3a}{4} = 7(4)$$

$$\begin{array}{r} 1+3a = 28 \\ -1 \quad -1 \\ \hline 3a = 27 \\ \frac{3a}{3} = \frac{27}{3} \\ a = 9 \end{array}$$

$$\{9\}$$

$$12) 82.296 = -2.7(6.1 - 5.9r)$$

$$\begin{array}{r} 82.296 = -16.47 + 15.93r \\ +16.47 \quad +16.47 \\ \hline 98.766 = 15.93r \\ \frac{98.766}{15.93} = \frac{15.93r}{15.93} \end{array}$$

$$6.2 = r$$

$$\{6.2\}$$

$$13) 8 = -6(3n - 1) + 2(9n + 1)$$

$$8 = -18n + 6 + 18n + 2$$

$$8 = -18n + 18n + 6 + 2$$

$$8 = 0 + 8$$

$$8 = 8$$

All Real #s $\{R\}$

$$14) -6(8 - 7m) = -3(-5 - 7m)$$

$$\begin{array}{r} -48 + 42m = 15 + 21m \\ -21m \quad -21m \\ \hline -48 + 21m = 15 \\ +48 \quad +48 \\ \hline 21m = 63 \\ \frac{21m}{21} = \frac{63}{21} \\ m = 3 \end{array}$$

$$\{3\}$$

Directions: Simplify each expression.

$$15) \frac{2}{3}(6x - 21)$$

$$\boxed{4x - 14}$$

$$16) 4 - 3(2 - x)$$

$$4 - 6 + 3x$$

$$\boxed{-2 + 3x}$$

$$17) 3(2x + 7) - 4(x - 2)$$

$$6x + 21 - 4x + 8$$

$$6x - 4x + 21 + 8$$

$$\boxed{2x + 29}$$

