

Multi-Step Equations

Solve each equation.

1) $6a + 5a = -11$

2) $-6n - 2n = 16$

5) $6r - 1 + 6r = 11$

6) $r + 11 + 8r = 29$

9) $42 = 8m + 13m$

10) $a - 2 + 3 = -2$

Multi-Step Equations

Solve each equation.

1) $6a + 5a = -11$ COMBINE LIKE TERMS

$$11a = -11$$

$$\frac{11a}{11} = \frac{-11}{11} \quad \text{DIVIDE BY } 11$$

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

2) $-6n - 2n = 16$ COMBINE LIKE TERMS

$$-8n = 16$$

$$\frac{-8n}{-8} = \frac{16}{-8} \quad \text{DIVIDE BY } -8$$

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

5) $6r - 1 + 6r = 11$ COMBINE LIKE TERMS

$$12r - 1 = 11$$

$$\frac{+1 \quad +1}{\quad \quad \quad} \quad \text{ADD } 1$$

$$12r = 12$$

$$\frac{12r}{12} = \frac{12}{12} \quad \text{DIVIDE BY } 12$$

$$\boxed{r = 1}$$

6) $r + 11 + 8r = 29$ COMBINE LIKE TERMS

$$9r + 11 = 29$$

$$\frac{-11 \quad -11}{\quad \quad \quad} \quad \text{SUBTRACT } 11$$

$$9r = 18$$

$$\frac{9r}{9} = \frac{18}{9} \quad \text{DIVIDE BY } 9$$

$$\boxed{r = 2}$$

9) $42 = 8m + 13m$ COMBINE LIKE TERMS

$$42 = 21m$$

$$\frac{42}{21} = \frac{21m}{21} \quad \text{DIVIDE BY } 21$$

$$\boxed{2 = m}$$

10) $a - 2 + 3 = -2$ COMBINE LIKE TERMS

$$a + 1 = -2$$

$$\frac{-1 \quad -1}{\quad \quad \quad} \quad \text{SUBTRACT } 1$$

$$\boxed{a = -3}$$

$$13) 37 = -3 + 5(x + 6)$$

$$14) -13 = 5(1 + 4m) - 2m$$

$$17) -6(1 - 5v) = 54$$

$$18) 8 = 8v - 4(v + 8)$$

$$21) 8(4k - 4) = -5k - 32$$

$$22) -8(-8x - 6) = -6x - 22$$

$$13) 37 = -3 + 5(x+6) \quad \text{DISTRIBUTE}$$

$$37 = (-3) + 5x + 30 \quad \text{COMBINE LIKE TERMS.}$$

$$37 = 5x + 27$$

$$\begin{array}{r} -27 \\ \hline \end{array} \quad \begin{array}{r} -27 \\ \hline \end{array} \quad \text{SUBTRACT 27}$$

$$10 = 5x \quad \text{DIVIDE BY 5}$$

$$\frac{10}{5} = \frac{5x}{5}$$

$$\boxed{2 = x}$$

$$14) -13 = 5(1+4m) - 2m \quad \text{DISTRIBUTE}$$

$$-13 = 5 + 20m - 2m \quad \text{LIKE TERMS}$$

$$-13 = 18m + 5 \quad \text{SUBTRACT 5}$$

$$\begin{array}{r} -5 \\ \hline \end{array}$$

$$-18 = 18m$$

$$\begin{array}{r} -18 \\ \hline \end{array} = \begin{array}{r} 18m \\ \hline \end{array} \quad \text{DIVIDE BY 18}$$

$$\frac{-18}{18} = \frac{18m}{18}$$

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

$$17) -6(1-5v) = 54 \quad \text{DISTRIBUTE}$$

$$-6 + 30v = 54 \quad \text{ADD 6}$$

$$\begin{array}{r} +6 \\ \hline \end{array} \quad \begin{array}{r} +6 \\ \hline \end{array}$$

$$30v = 60$$

DIVIDE BY 30

$$\frac{30v}{30} = \frac{60}{30}$$

$$\boxed{v = 2}$$

$$18) 8 = 8v - 4(v+8) \quad \text{DISTRIBUTE}$$

$$8 = 8v - 4v - 32 \quad \text{LIKE TERMS}$$

$$8 = 4v - 32 \quad \text{ADD 32}$$

$$\begin{array}{r} +32 \\ \hline \end{array} \quad \begin{array}{r} +32 \\ \hline \end{array}$$

$$40 = 4v$$

DIVIDE BY 4

$$\frac{40}{4} = \frac{4v}{4}$$

$$\boxed{10 = v}$$

$$21) 8(4k-4) = -5k-32 \quad \text{DISTRIBUTE}$$

$$32k - 32 = -5k - 32 \quad \text{ADD 5K SO THAT VARIABLES ARE ON SAME SIDE.}$$

$$37k - 32 = -32 \quad \text{ADD 32}$$

$$\begin{array}{r} +32 \\ \hline \end{array} \quad \begin{array}{r} +32 \\ \hline \end{array}$$

$$37k = 0$$

DIVIDE BY 37

$$\frac{37k}{37} = \frac{0}{37}$$

$$\boxed{k = 0}$$

$$22) -8(-8x-6) = -6x-22$$

$$64x + 48 = -6x - 22 \quad \text{ADD 6X SO THAT VARIABLES ARE ON SAME SIDE.}$$

$$70x + 48 = -22$$

$$\begin{array}{r} -48 \\ \hline \end{array} \quad \begin{array}{r} -48 \\ \hline \end{array} \quad \text{SUBTRACT 48}$$

$$70x = -70$$

DIVIDE BY 70

$$\frac{70x}{70} = \frac{-70}{70}$$

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

Multi-Step Equations

Solve each equation.

3) $8x - 2 = -9 + 7x$

4) $a + 5 = -5a + 5$

7) $5p - 14 = 8p + 4$

8) $p - 4 = -9 + p$

13) $-18 - 6k = 6(1 + 3k)$

14) $5n + 34 = -2(1 - 7n)$

Multi-Step Equations

Solve each equation.



$$3) \quad 8x - 2 = -9 + 7x$$

-7x -7x

SUBTRACT 7X

$$x - 2 = -9$$

$$+2 \quad +2$$

ADD 2

$$\boxed{x = -7}$$

$$4) \quad a + 5 = -5a + 5$$

ADD 5a

$$+5a = 5a$$

$$6a + 5 = 5$$

$$-5 \quad -5$$

SUBTRACT 5

$$6a = 0$$

DIVIDE BY 6

$$\frac{6a}{6} = \frac{0}{6}$$

$$\boxed{a = 0}$$

$$7) \quad 5p - 14 = 8p + 4$$

$$-8p \quad -8p$$

$$-3p - 14 = 4$$

$$+14 \quad +14$$

$$-3p = 18$$

$$\frac{-3p}{-3} = \frac{18}{-3}$$

$$-3 \quad -3$$

$$\boxed{p = -6}$$

$$8) \quad p - 4 = -9 + p$$

$$-p \quad -p$$

$$-4 = -9$$

FALSE

$$\boxed{\text{NO SOLUTION}}$$

VARIABLE WAS ELIMINATED AND $-4 = -9$ IS NOT TRUE, THEREFORE THERE IS NOT A SOLUTION FOR THIS EQUATION.

NO NUMBER CAN BE SUBSTITUTED FOR P TO MAKE A TRUE STATEMENT.

$$13) \quad -18 - 6k = 6(1 + 3k)$$

DISTRIBUTE

$$-18 - 6k = 6 + 18k$$

$$-18k \quad -18k$$

$$-18 - 24k = 6$$

$$+18 \quad +18$$

$$-24k = 24$$

$$\frac{-24k}{-24} = \frac{24}{-24}$$

$$-24 \quad -24$$

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

$$14) \quad 5n + 34 = -2(1 - 7n)$$

DISTRIBUTE

$$5n + 34 = -2 + 14n$$

$$-14n \quad -14n$$

$$-9n + 34 = -2$$

$$-34 \quad -34$$

$$-9n = -36$$

$$\frac{-9n}{-9} = \frac{-36}{-9}$$

$$-9 \quad -9$$

$$\boxed{n = 4}$$