

## 2.2 Solving One-Step Equations

What are inverse operations?

operations that undo/reverse  
one another  $+/-$   $\cdot/\div$

What are equivalent equations?

equations that have the  
same solution

Solve each equation & check your solution.

$$\begin{array}{r}
 1. \quad \boxed{x} + 4.3 = 1.2 \\
 \downarrow \quad -4.3 \quad -4.3 \\
 \hline
 x \qquad \qquad = -3.1
 \end{array}$$

Check:  $?$   
 $-3.1 + 4.3 \stackrel{?}{=} 1.2$   
 $1.2 = 1.2 \checkmark$

$$\begin{array}{r}
 2. \quad k + (-10) = -1 \\
 k - 10 = -1 \\
 \quad +10 \quad +10 \\
 \hline
 k \qquad \qquad = 9
 \end{array}$$

Check:  $9 + (-10) \stackrel{?}{=} -1$   
 $-1 = -1 \checkmark$

Solve each equation & check your solution.

$$3. \quad \begin{array}{r} \cancel{-8} + d = -15 \\ +8 \qquad \qquad +8 \\ \hline d = -7 \end{array}$$

$$\text{Check: } -8 + (-7) \stackrel{?}{=} -15 \\ -15 = -15 \checkmark$$

$$4. \quad \begin{array}{r} -12.2 = n \boxed{+(-7.5)} \\ -12.2 = n - 7.5 \\ +7.5 \qquad \qquad +7.5 \\ \hline -4.7 = n \end{array}$$

$$\text{Check: } -12.2 \stackrel{?}{=} -4.7 + (-7.5) \\ \checkmark -12.2 = -12.2$$

Solve each equation.

$$5. \quad \begin{array}{r} m \boxed{-\left(-\frac{3}{8}\right)} = -\frac{5}{16} \\ m + \frac{3}{8} = -\frac{5}{16} \\ -\frac{3}{8} \qquad \qquad -\frac{3}{8} \cdot 2 = \frac{6}{16} \\ \hline m = -\frac{11}{16} \end{array}$$

$$\text{Check: } -\frac{11}{16} - \left(-\frac{3}{8}\right) \stackrel{?}{=} -\frac{5}{16} \\ \checkmark -\frac{5}{16} = -\frac{5}{16}$$

$$6. \quad \begin{array}{r} -\frac{5}{6} + f = -3\frac{1}{2} \\ -\frac{5}{6} + f = -\frac{7 \cdot 3}{2 \cdot 3} = -\frac{21}{6} \\ +\frac{5}{6} \qquad \qquad +\frac{5}{6} \\ \hline f = -\frac{16}{6} \cdot \frac{2}{2} \\ f = -\frac{8}{3} \end{array}$$

$$\text{Check: } -\frac{5}{6} + -\frac{8}{3} \stackrel{?}{=} -\frac{7}{2} \\ \checkmark -\frac{7}{2} = -\frac{7}{2}$$

Solve each equation & check your solution.

$$7. \quad \frac{-6k}{-6} = \frac{3 \div 3}{-6 \div 3}$$

$$k = -\frac{1}{2}$$

Check:  $-6(-\frac{1}{2}) \stackrel{?}{=} 3$   
 $3 = 3 \checkmark$

$$8. \quad \frac{-2.4p}{-2.4} = \frac{-1.44}{-2.4}$$

$$p = 0.6$$

Check:  $-2.4(0.6) \stackrel{?}{=} -1.44$   
 $\checkmark -1.44 = -1.44$

$$9. \quad \frac{16 \cdot d}{16} = -4 \cdot 16$$

$$d = -64$$

Check:  $\frac{-64}{16} \stackrel{?}{=} -4$   
 $-4 = -4 \checkmark$

$$10. \quad \frac{8 \cdot 5}{12} = \frac{h}{8} \cdot 8$$

$$-\frac{10}{3} = h$$

Check:  $\frac{5}{12} \stackrel{?}{=} \frac{-\frac{10}{3}}{-8}$   
 $\frac{5}{12} = \frac{5}{12} \checkmark$

Solve each equation.

$$11. \quad 2\frac{1}{3}m = -3\frac{1}{9}$$

$$\frac{3}{7} \cdot \frac{7}{3}m = -\frac{28}{9} \cdot \frac{3}{7}$$

$$m = -\frac{4}{3}$$

Check:  $\frac{7}{3}(-\frac{4}{3}) \stackrel{?}{=} -\frac{28}{9}$   
 $-\frac{28}{9} = -\frac{28}{9} \checkmark$

$$12. \quad \frac{-5w}{-5} = \frac{-0.75}{-5}$$

$$w = 0.15$$

$$13. \quad \frac{-15}{45} = \frac{45k}{45}$$

$$-\frac{1}{3} = m$$

$$14. \quad 5\frac{1}{4} = 3\frac{1}{2}f$$

$$\frac{2}{7} \cdot \frac{21}{4} = \frac{7}{2}f \cdot \frac{2}{7}$$

$$\frac{3}{2} = f$$

15. What number increased by 45 is  $-78$ ?

Define a variable, write an equation, and solve.

$$\begin{array}{r} \text{Let } x = a \# \\ x + 45 = -78 \\ \underline{-45 \quad -45} \\ x = -123 \end{array}$$

16. A traffic helicopter descended 160 meters to observe road conditions. It leveled off at 225 meters. What was its original altitude? Define a variable, write an equation, & solve.

Let  $x = \text{original altitude}$

$$\begin{array}{r} x - 160 = 225 \\ \underline{+160 \quad +160} \\ x = 385 \text{ meters} \end{array}$$

17. The area of a rectangle is  $28 \text{ cm}^2$ . Find the width. Write an equation and solve.

$$\begin{array}{l} A = lw \\ 28 = 6w \\ \underline{\quad 6 \quad 6} \\ \frac{14}{3} \text{ cm} = w \end{array}$$



18. One fourth <sup>mult.</sup> of a number is  $-16.325$ .

What is the number? Define a variable, write an equation and solve.

$$\begin{array}{l} \text{Let } x = a \# \\ \frac{4}{4} \cdot \frac{1}{4}x = -16.325 \cdot \frac{4}{4} \\ x = -65.3 \end{array}$$

19. Tim sold 16 cars last month. This is 18 fewer cars than he sold during the same time period one year ago. What were his sales one year ago? Define a variable, write an equation, and solve. *Let  $x$  = sales 1 year ago*

$$\begin{array}{r} x - 18 = 16 \\ + 18 \quad + 18 \\ \hline x = 34 \text{ cars} \end{array}$$

20. A rancher lost 47 cattle because of the summer drought. His herd now numbers 396. How large was the herd before the drought? Define a variable, write an equation, and solve. *Let  $x$  = herd before drought*

$$\begin{array}{r} x - 47 = 396 \\ + 47 \quad + 47 \\ \hline x = 443 \text{ cattle} \end{array}$$