Solving for the Unknown Value
Answer Key

The Division of Water Quality makes no claim as the accuracy of any answers provided herein.

PRACTICE PROBLEMS 2.1: Solving for x —The Basics

☐ Solve for x in the problems given below.

1. $19{,}747 = (20)(12)(x)(7.48)$

   $19{,}747 = 1{,}795.2\,x$

   $x =$ 11

2. $\dfrac{(15)(12)(1.25)(7.48)}{x} = 337$

   $337\,x = 1683$

   $x =$ 4.99

3. $\dfrac{x}{(4.5)(8.34)} = 213$

   $x = 7993.9$

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4. $\dfrac{x}{246} = 2.4$

   $x = 590.4$

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5. $6 = \dfrac{(x)(0.18)(8.34)}{(65)(1.3)(8.34)}$

   $1.5\,x = 4228.38$

   $x =$ 2818.92

6. $\dfrac{(3000)(3.6)(8.34)}{(0.785)(x)} = 23.4$

   $18.37\,x = 90{,}072$

   $x =$ 4.903.21

7. $109 = \dfrac{x}{(0.785)(80)(80)}$

   $x = 547{,}616$

   $x =$ 547 616

8. $(x)(3.7)(8.34) = 3620$

   $30.86\,x = 3620$

   $x =$ 117.31

9. $2.5 = \dfrac{1{,}270{,}000}{x}$

   $2.5\,x = 1{,}270{,}000$

   $x =$ 508,000

10. $0.59 = \dfrac{(170)(2.42)(8.34)}{(1980)(x)(8.34)}$

    $9742.79\,x = 3431.08$

    $x =$ 0.35

PRACTICE PROBLEMS

1. $(0.785)(D^2) = 5024$

$D^2 = \frac{5024}{0.785}$

$D =$ 80

2. $(x^2)(10)(7.48) = 10{,}771.2$

$74.8\,x^2 = 10{,}771.2$

$x =$ 12

3. $51 = \frac{64{,}000}{(0.785)(D^2)}$

$40.04\,D^2 = 64{,}000$

$D =$ 39.98

4. $(0.785)(D^2) = 0.54$

$D^2 = \frac{0.54}{0.785}$

$D =$ 0.83

5. $2.1 = \frac{(0.785)(D^2)(15)(7.48)}{(0.785)(80)(80)}$

$88.08\,D^2 = 10{,}550.4$

$D =$ 10.94

PRACTICE PROBLEMS 2.3: Addition and Subtraction Problems

☐ Find the value of x in the problems given below.

1. $6.7 = x + 0.9$

   $x = 6.7 - 0.9$

   $x =$ 5.8

2. $16 + x + 18 + 42 = 121$

   $76 + x = 121$

   $x =$ 45

3. $9.8 - x = 7.9$

   $x = 9.8 - 7.9$

   $x =$ 1.9

4. $19 + x - 14 = 16 + 3$

   $5 + x = 19$

   $x =$ 14

5. $82 + 50 - x = 109$

   $132 - x = 109$

   $x =$ 23

PRACTICE PROBLEMS 2.4: Solving for x—Advanced Problems

1. $4x + 15 = 433$

$4x = 418$

$x =$ 104.5

2. $\frac{(6+x)(4)}{2} = 32$

$12 + 2x = 32$

$x =$ 10

3. $0.051 = \frac{2150 + 792}{x + 28{,}540}$

$0.051x + 1455.54 = 2942$

$x =$ 29 146.27

4. $0.048 = \frac{x + 940}{19{,}410 + 20{,}490}$

$1915.20 = x + 940$

$x =$ 975.2

5. $\frac{(9+5)(x)}{2} = 35$

$7x = 35$

$x =$ 5

6. $\frac{(6920)(8.34)(x) + (4610)(8.34)(0.07)}{57{,}800 + 38{,}120} = 23.4$

$57{,}712.8x + 2691.32 = 2244.528$

$x =$ 38.84

7. $\frac{(2610)(0.44)(8.34)}{(5800)(x)(8.34) + (20)(1.6)(8.34)} = 8.2$

$396{,}650.4x + 2188.42 = 9577.66$

$x =$ 0.02

8. $\frac{(6620)(8.34)(0.04) + (4480)(8.34)(0.065)}{58{,}100 + x} = 0.04$

$0.04x + 2324 = 4637.04$

$x =$ 57.826

9. $\frac{(x + 5.5)}{2}(3.5)(145) = 3426$

$253.75x + 1395.625 = 3426$

$x =$ 8.0

10. $\frac{(12{,}400)(0.95)(8.34)}{(6100)(0.032)(8.34) + (x)(1.95)(8.34)} = 9.1$

$14814.5 + 147.99x = 98245.2$

$x =$ 563.76