

7. A car rental agency charges \$22.50 per day plus \$0.10 per mile to rent a car. How many miles was the car driven if the charge for one day was \$33.60?

Example 7 Application: Solving Equations

A car rental agency charges \$14.50 per day plus \$0.15 per mile. How many miles was the car driven if the charge for one day was \$48.25?

Solution

Let x = the number of miles driven.

Then $0.15x$ = the charge for the miles driven.

The related equation is as follows.

$$\begin{aligned} 14.50 + 0.15x &= 48.25 \\ 14.50 + 0.15x - 14.50 &= 48.25 - 14.50 \\ 0.15x &= 33.75 \\ \frac{0.15x}{0.15} &= \frac{33.75}{0.15} \\ x &= 225 \end{aligned}$$

The car was driven 225 miles.

Now work margin exercise 7.

Completion Example Answers

5. Add -18.4 to both sides. Simplify. Add $-1.5y$ to both sides. Simplify. Divide both sides by -0.9 . Simplify.

Margin Exercise Answers

1. $y = 0.3$ 2. $x = -0.5$ 3. $y = 1.2$ 4. $x = 1.9$ 5. $x = 118$ 6. Burger costs \$9.70 and fries cost \$1.20
7. 111 miles

4.7 Exercises

Concept Check

Fill-in-the-Blank. Complete each sentence using information found in this section.

- The objective in solving equations of the types discussed in this section is to isolate the variable on one side of the equation with a coefficient of _____.
- After removing grouping symbols, combine _____ on each side of the equation.
- Use the addition principle so that _____ are on one side of the equation and _____ are on the other side.
- In solving an equation, multiply both sides of the equation by the _____ of the coefficient of the variable or _____ both sides by the coefficient.

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

- When an equation is solved, the variable should always be on the left side.
- In solving an equation, do not divide both sides of the equation by a negative number.

Practice

Solve each equation. See Examples 1 through 5.

- $x + 34.8 = 7.5 - 80$
- $x - 27.9 = 18.3 - 20$
- $16.5 + y = 30 - 15.2$
- $20.1 + y = 16.8 + 50$
- $0.7x + 10.2 = 31.9$
- $0.3x + 17.8 = 57.1$
- $0.5x - 22.7 = 14.35$
- $0.6x - 34.6 = 15.26$
- $8x + 6.45 = -20.03$
- $9x + 8.57 = -124.9$
- $0.2(y + 6.3) = 17.5$
- $0.3(y + 5.4) = 22.77$
- $\frac{1}{10}y - 3.99 = 12.6$
- $\frac{1}{10}y - 4.56 = 27.8$
- $\frac{1}{2}t - 16.3 = -21.45$
- $\frac{1}{3}t - 0.5 = -17.8$
- $0.01t - 10.3 = 14.73$
- $0.02t + 16.5 = 22.8$
- $0.3x + 0.1(x - 15) = 0.116$
- $-0.5(x + 8.5) = -0.3x - 10.3$
- $-0.4(x - 12.7) = -0.2x + 11.65$
- $0.12y + 0.25y - 58.95 = 4.3y$
- $3y - 4y = -22.88 + y$
- $8y + 7y = -35.45 + 20y$
- $1.3 - 0.4z + z = -1.2$
- $2.4y - 3.25 + 0.6y = 14.5$
- $8.5 - 1.6z - z = 13.8$
- $2.1y + 13.1 + y = 4.2$
- $3.2x + 0.11 = 5(x + 0.022)$
- $7.2x - 0.33 = 4(x - 0.0825)$
- $6x + 0.9 = 2x - 1.1$
- $7.5x + 5 = 11.5x + 17.4$
- $5.1x + 6 = 2.5x + 19.52$
- $-x + 30 = 5.2x + 3.65$
- $5(2.3x - 3.2) = 6.05 + x$
- $1.7x + 4.42 = 3.4(1.1x + 2.2)$
- $2(4x + 8.43) = 3(5x - 2.5)$
- $-1.3(2.4x + 7.5) = -5.52x - 0.87$
- $8x - 5 + 9x = -x + 12 - 8$
- $-2x + 4 + 3 = x + 2x - 7$
- $10.1x - 5.2 + 3.6 = 9.6x + 0.4x + 1.5$
- $11.6x - 7.3 + 8.1x = 0.2x + 4.16 + 10 + 4.7x$
- $5(x + 2.1) = 7(x + 0.8) + 7.5$

44. $4(3x - 1.52) + x = 5(1.8x + 7.32)$

45. $1.8(7.9x - 13.4) + 2.494$
 $= -2.1(6.4x - 7.9) + 25.402$

46. $0.3 - 3.4(2.4x + 5.4)$
 $= 10.14 + 3.6(1.4x + 1.7)$

47. $0.7(z + 14.1) = 0.3(z + 32.9)$

48. $0.8(z - 6.21) = 0.2(z - 24.84)$

Applications

Solve.

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49. The cost of a video game and game guide was \$72.75. If the game guide was \$38.15 less than the price of the game, what was the price of each item?
50. A pair of tennis shoes and a shirt cost a total of \$53.74. If the price of the tennis shoes was \$20.50 more than the price of the shirt, what was the price of each item?
51. If 14.66 plus twice a number equals the sum of the number and 1.56, what is the number?
52. If six times a number is increased by 15.35, the result is 12.5 less than the number. What is the number?
53. A truck rental agency rents trucks for \$45.50 per day plus \$0.25 per mile. If the fee for one day's use was \$105.50, how many miles was the truck driven?
54. If the rental on a car is \$35 per day plus \$0.18 per mile, what would be the total paid if the car was driven for 150 miles in one day?

Writing & Thinking

55. In your own words, answer each of the following questions.
- What is the goal of solving equations?
 - How do the addition and subtraction principles of equality help you reach the goal of solving equations?
 - How do the multiplication and division principles of equality help you reach the goal of solving equations?
56. Why is checking your answer in the original equation especially important when working with decimal numbers?