

Concept and Vocabulary:

1. The multiplication property of equality states that if $a = b$ and $c \neq 0$, then $ac =$ _____.
2. The multiplication property of equality lets us multiply or _____ both sides of an equation by the same nonzero number.

Practice Exercises:

In exercises 1 - 27 odd, solve each equation using the multiplication property of equality. **Check your solutions for problems 7, 17 and 25.**

1. $\frac{x}{6} = 5$

7. $-7y = 63$ Check:

3. $\frac{x}{-3} = 11$

9. $-28 = 8z$

5. $5y = 35$

11. $-18 = -3z$

$$13. -8x = 6$$

$$21. -x = 17$$

$$15. 17y = 0$$

$$23. -47 = -y$$

$$17. \frac{2}{3}y = 12 \quad \text{Check:}$$

$$25. -\frac{x}{5} = -9 \quad \text{Check:}$$

$$19. 28 = -\frac{7}{2}x$$

$$27. 2x - 12x = 50$$

In exercises 29 - 53 odd, solve each equation using both the addition and multiplication properties of equality. **Check your solutions for problems 35, 43 and 53.**

$$29. 2x + 1 = 11$$

$$31. 2x - 3 = 9$$

$$33. -2y + 5 = 7$$

$$43. 3z = -2z - 15 \quad \text{Check:}$$

$$35. -3y - 7 = -1 \quad \text{Check:}$$

$$45. -5x = -2x - 12$$

$$37. 12 = 4z + 3$$

$$47. 8y + 4 = 2y - 5$$

$$39. -x - 3 = 3$$

$$49. 6z - 5 = z + 5$$

$$41. 6y = 2y - 12$$

$$51. 6x + 14 = 2x - 2$$

53. $-3y - 1 = 5 - 2y$ Check:

The equations in exercises 55 and 57, contain small geometric figures that represent real numbers. Use the multiplication property of equality to isolate x on one side of the equation and the geometric figures on the other side.

55. $\frac{x}{\square} = \triangle$

57. $\triangle = -x$

In exercises 59 and 63, use the given information to write an equation. Let x represent the number described in each exercise. Then solve the equation and find the number.

59. If a number is multiplied by 6, the result is 10. Find the number.
63. Eight subtracted from the product of 4 and a number is 56. Find the number.

Application Exercises:

The Mach number is a measurement of speed, named after the man who suggested it, Ernst Mach (1838 - 1916). The formula

$$M = \frac{A}{740},$$

indicates that the speed of an aircraft, A , in miles per hour divided by the speed of sound, approximately 740 miles per hour, results in the Mach number, M . Use the formula to determine the speed, in miles per hour, of the aircrafts in exercise 69. (Note: When an aircraft's speed increases beyond Mach 1, it is said to have broken the sound barrier.

69. The Concorde airplane can reach Mach 2.03. What is the Concorde's maximum speed in miles per hour?

71. Using today's dollar, the data in the bar graph shown on page 131 can be described by the mathematical model

$$F = -48n + 21,000,$$

where F is the price of the least expensive Ford n years after 1904.

- a. Does the formula underestimate or overestimate the price of the least expensive Ford in 2009? By how much?
- b. If trends shown by the formula continue, when will the least expensive Ford cost \$15,000?