

3-3

Solving Equations by Using Multiplication and Division (Pages 135–140)

You can solve a multiplication or division equation by using the Multiplication and Division Properties of Equality.

Multiplication Property of Equality	For any numbers a , b , and c , if $a = b$, then $ac = bc$.
Division Property of Equality	For any numbers a , b , and c , with $c \neq 0$, if $a = b$, then $\frac{a}{c} = \frac{b}{c}$.

Examples

a. Solve $(2\frac{1}{2})x = 1\frac{3}{4}$.

Rewrite the mixed numbers as improper fractions.

$\frac{5}{2}x = \frac{7}{4}$ Multiply each side by $\frac{2}{5}$, the reciprocal of the number that is multiplied by x .

$(\frac{2}{5})(\frac{5}{2})x = (\frac{7}{4})(\frac{2}{5})$ so $x = \frac{14}{20}$ or $\frac{7}{10}$.

b. Solve $7y = -63$.

Since y has been multiplied by 7, divide each side by 7 to isolate the variable.

$\frac{7y}{7} = \frac{-63}{7}$, so $y = -9$.

Try These Together

1. Solve $-5a = 55$.

HINT: Divide each side by -5 or multiply by $\frac{1}{-5}$.

2. Solve $\frac{x}{-5} = 4$.

HINT: Multiply each side by -5 .

Practice

Solve each equation. Check your solution.

3. $6y = 54$

4. $-7d = -84$

5. $22b = 176$

6. $2.4f = 21.6$

7. $0.36g = 1.8$

8. $\frac{1}{6}k = 8$

9. $-\frac{4}{5}m = 2$

10. $\frac{n}{8} = -4$

11. $\frac{p}{-6} = \frac{7}{12}$

12. $(-2\frac{1}{3})q = 21$

13. $5x = \frac{10}{13}$

14. $\frac{-r}{8} = -18$

Define a variable, write an equation and solve the problem.

15. Two-thirds of a number is $9\frac{3}{5}$.

16. Negative fourteen times a number is 84.

Complete.

17. If $6a = 36$, then $3a = \underline{\quad?}$.

18. If $2d = 7$, then $10d = \underline{\quad?}$.

19. **Standardized Test Practice** There are nine boys in a class. If the boys make up three-eighths of the entire class, how many students are in the class?

A 72

B 24

C 20

D 10

Answers: 1. -11 2. -20 3. 9 4. 12 5. 8 6. 9 7. 5 8. 48 9. $-2\frac{1}{2}$ 10. -32 11. $-3\frac{2}{3}$ 12. -9 13. $\frac{13}{2}$ 14. 144 15. $14\frac{5}{2}$ 16. -6 17. 18 18. 35 19. B
