First 5 Minutes — Review Question

GRADE 7 • TOPIC 5 • LESSON 5.3 | 5 points • Work independently

Lesson 5.3 • Solve Equations Using the Distributive Property

Solve $-4x + 3 = 19$.

1. Show each step in your notebook.
2. Explain the operation or rule you used.

Real-Life Connection & Key Concepts

Essential question

How does the Distributive Property help solve equations?

Explain It!

Six friends pay $683.88 for jet skiing, including a $12 vest fee per person. Let r be the rental cost per person. Which equation is correct: 6r + 12 = 683.88 or 6(r + 12) = 683.88? Explain.

What we will learn

Distribute positive and negative factors; combine like terms; solve equations with grouped expressions and rational numbers.

Definitions & rules

Distributive Property: a(b + c) = ab + ac.

Multiply every term inside parentheses, including negative terms.

Combine like terms before isolating the variable.

Example 1 — Distributive Property

GRADE 7 • TOPIC 5 • LESSON 5.3 | Guided example • Model and explain

Problem

Each of Chen’s 10 graphic novels increased in value by $3.50. Their current total is $75. Find the original value g of one novel.

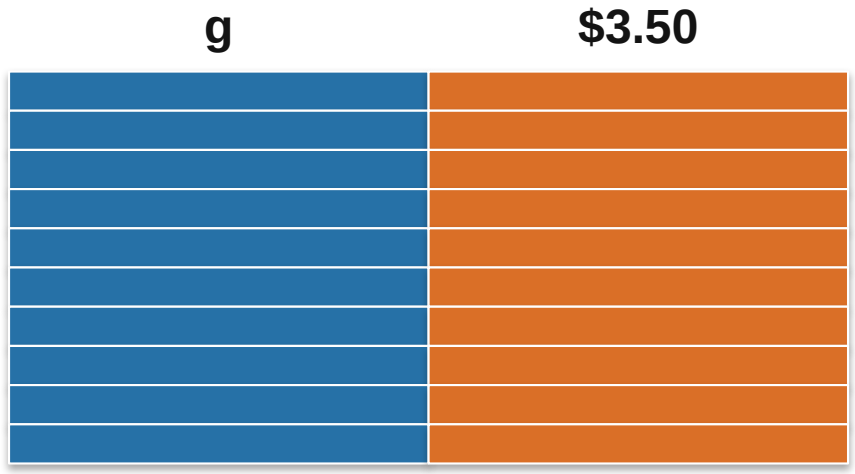
Worked solution

$10(g + 3.50) = 75.$

$10g + 35 = 75 \rightarrow 10g = 40.$

$g = \$4$. Check: $10(4 + 3.50) = 75$.

Distribute to every term, combine like terms, then isolate the variable.



10 equal rows

Example 2 — Distributive Property

Problem

Solve $-5(s + 30) = -17$.

Worked solution

$-5s - 150 = -17$.

$-5s = 133$.

$s = -\frac{133}{5} = -26\ \frac{3}{5}$.

Distribute to every term, combine like terms, then isolate the variable.

Example 3 — Distributive Property

GRADE 7 • TOPIC 5 • LESSON 5.3 | Guided example • Model and explain

Problem

A cheerleading squad receives one fourth of foam-finger and pom-pom sales. It receives $136.75; foam-finger sales are $258. Find pom-pom sales p.

Worked solution

$(\frac{1}{4})(p + 258) = 136.75.$

$(\frac{1}{4})p + 64.50 = 136.75.$

$(\frac{1}{4})p = 72.25 \rightarrow p = \$289.$

Distribute to every term, combine like terms, then isolate the variable.

Total sales = p + $258



Squad receives $136.75

Individual Work

GRADE 7 • TOPIC 5 • LESSON 5.3 | 10 minutes total • 10 points

Complete all five tasks. Show your reasoning.

7. (p. 279) Solve $-2(x + 5) = 4$.

8. (p. 279) Solve $3.2 = (\frac{4}{5})(b - 5)$.

9. (p. 279) Solve $\frac{p + 24}{8} = 9$.

Individual Work — continued

GRADE 7 • TOPIC 5 • LESSON 5.3 | 10 minutes total • 10 points

Finish the remaining problems. Check your work.

10. (p. 279) Solve $\left(\frac{2}{3}\right)(6a + 9) = 20.4$.

11. (p. 279) Solve $6\left(\frac{d}{3} - 5\right) = 34$ by distributing or dividing first. Compare the last operation.

Individual Work — Answer Key

GRADE 7 • TOPIC 5 • LESSON 5.3 | Check your answers

Distribute to every term, combine like terms, then isolate the variable.

7. (p. 279)

$-2(x + 5) = 4 \rightarrow -2x - 10 = 4 \rightarrow -2x = 14 \rightarrow x = -7.$

8. (p. 279)

$3.2 = (\frac{4}{5})(b - 5) \rightarrow 3.2 = 0.8b - 4 \rightarrow 7.2 = 0.8b \rightarrow b = 9.$

9. (p. 279)

$\frac{p + 24}{8} = 9 \rightarrow \frac{p}{8} + 3 = 9 \rightarrow \frac{p}{8} = 6 \rightarrow p = 48.$

10. (p. 279)

$(\frac{2}{3})(6a + 9) = 20.4 \rightarrow 4a + 6 = 20.4 \rightarrow 4a = 14.4 \rightarrow a = 3.6.$

11. (p. 279)

Distribute: $2d - 30 = 34$; $2d = 64$; $d = 32$ (divide last). Or divide by 6: $\frac{d}{3} - 5 = \frac{17}{3}$; $\frac{d}{3} = \frac{32}{3}$; $d = 32$ (multiply last).

Group Work

GRADE 7 • TOPIC 5 • LESSON 5.3 | 8 minutes total • 10 points

Work together. Each person must contribute a solution.

12. (p. 279) Four airline tickets plus $19 travel insurance per ticket cost $752. Write and solve for the price x of one ticket.

13. (p. 279) A charity receives one third of craft-fair and bake-sale funds, totaling $137.45. The craft fair raised $252.60. How much did the bake sale raise?

Group Work — continued

GRADE 7 • TOPIC 5 • LESSON 5.3 | 8 minutes total • 10 points

Agree on a solution and be ready to explain it.

14. (p. 280) A student distributes $-3(6 - r)$ incorrectly. Solve $-3(6 - r) = 6$ and explain the sign.

17. (p. 280) Twelve televisions cost $900 including a $15 charge per television. Find the original cost per television.

Group Work — Answer Key

Distribute to every term, combine like terms, then isolate the variable.

12. (p. 279)

$4(x + 19) = 752 \rightarrow x + 19 = 188 \rightarrow x =$ \$169.

13. (p. 279)

$\frac{252.60 + b}{3} = 137.45 \rightarrow 252.60 + b = 412.35 \rightarrow b =$ \$159.75.

14. (p. 280)

$-3(6 - r) = 6 \rightarrow -18 + 3r = 6 \rightarrow 3r = 24 \rightarrow r = 8$. Error: negative times negative is positive.

17. (p. 280)

$12(m + 15) = 900 \rightarrow m + 15 = 75 \rightarrow m =$ \$60 per television.

Exit Ticket

GRADE 7 • TOPIC 5 • LESSON 5.3 | 2 minutes • Independent check

Before you leave, solve this problem.

Solve $-2(3x - 4) + 5x = 12$.

Show your work.

Write the answer with the correct units or graph, if needed.