Solve Equations Using the Distributive Property

45-minute instructional plan | Minnesota 2007 standards: 7.2.4.1; 7.2.3.1

Learning objectives

• Distribute a factor to every term within parentheses.

• Combine like terms before isolating the variable.

• Solve and check equations with positive or negative rational coefficients.

• Identify and correct distribution errors.

Suggested 45-minute sequence

0–5 min	Review and quick check
5–8 min	Why the lesson matters / real-life launch
8–11 min	Read the learning objectives
11–18 min	Explore model and vocabulary
18–30 min	Guided examples and error analysis
30–38 min	Independent practice
38–43 min	Group reasoning
43–45 min	Independent exit ticket

Core concept

Multiplication applies to every term inside the grouping symbols.

$$3(x-4)+7=3x-12+7$$

Teaching prompts

• Ask students to name the unknown and units before manipulating the equation or inequality.

• Ask: Which steps preserve the solution set, and why?

Common misconception / correction

A student rewrites 5(x – 2) as 5x – 2. Explain the mistake using five groups.

$$5(x-2)=5x-10$$

Multiply both x and –2 by 5; do not multiply just one term.

Differentiation and assessment

Support: pre-label the variable, highlight fixed versus repeated quantities, and provide an annotated example. Extension: require a second representation or a reasoned equivalence argument.

Assessment: a correct exit response with justified steps suggests readiness for the next lesson; otherwise use an additional model and one follow-up problem.

Worked answer key

1. Solve 2(x + 5) = 24.

$$x = 7$$

2. Solve 4(p – 3) + 5 = 33.

$$p = 10$$

3. Solve –(3x – 6) + 2 = –7.

$$x = 5$$

4. Solve half of (4n + 6) equals 13.

$$\frac{1}{2}(4n + 6) = 13 \Rightarrow n = 5$$

5. Solve 2(3y – 4) + y = 27.

$$y = 5$$

Group challenge

Four tickets each receive a $3 discount from original price p, plus a one-time $6 processing fee. The group pays $66. Form and solve the equation.

$$4(p - 3) + 6 = 66 \Rightarrow p = 18$$

Additional practice — if time allows

Solve –3(2m – 1) + 2m = –9.

$$-6m + 3 + 2m = -9 \Rightarrow m = 3$$

Exit ticket

Solve 3(2x – 1) + 5 = 32.

$$3(2x - 1) + 5 = 32 \Rightarrow x = 5$$

Teaching note

Ask students to justify their methods. Use incorrect answers to identify the next instructional step.