Evaluating Expressions with Grouping Symbols

Evaluating Expressions with Grouping Symbols: Apply, Compare, and Design

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Evaluate innermost grouping symbols first, then multiplication/division, then addition/subtraction. Brackets and braces work like parentheses. For $3 \times [8 - (2 + 1)]$, compute $2 + 1 = 3$, then $8 - 3 = 5$, then $3 \times 5 = 15$.

Worked example

Evaluate $5 \times [12 - (4 + 2)]$.

1. $4 + 2 = 6$.
2. $12 - 6 = 6$.
3. $5 \times 6 = 30$.
Answer: 30.

Practice Problems

Show your thinking.

1. A game starts with 40 points. Two rounds each lose $3 + 5$ points. Evaluate $40 - 2 \times (3 + 5)$ for the final score.

2. Design a grouped expression using $24, 8, 4$ once each with subtraction and division that equals 4.

3. Plan A is $6 \times (7 + 2)$ chairs; plan B is $6 \times 7 + 2$ chairs. Which has more and by how many?

4. Five equal teams share the points $100 - [4 \times (3 + 2)]$. Find points per team.

5. Choose a whole number for the box so $3 \times [5 + (\square - 2)] = 30$.

6. A ticket plan uses $4 \times (9 - 2)$ dollars. A child calls it $4 \times 9 - 2 = 34$ dollars. Find the correct cost and overstatement.

7. Find the number of 6-seat tables needed for $3 \times (8 + 4)$ guests.

8. Two crate plans give $2 \times [15 + (12 \div 3)]$ and $2 \times 15 + 12 \div 3$ items. Compute the difference.

Answer Key

1. 24 points.
2. $(24 - 8) \div 4 = 4$.
3. A; 10 more chairs.
4. 16 points.
5. 7.
6. 28 dollars; overstated by 6 dollars.
7. 6 tables.
8. 4 items.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Loss per round: $3 + 5 = 8$ points.
2. Two rounds lose $2 \times 8 = 16$ points.
3. Final score: $40 - 16 = 24$ points.

Problem 2

1. The desired quotient needs $4 \times 4 = 16$ as dividend.
2. $24 - 8 = 16$, so group the subtraction.
3. $16 \div 4 = 4$.

Problem 3

1. A: $7 + 2 = 9$, then $6 \times 9 = 54$.
2. B: $6 \times 7 + 2 = 42 + 2 = 44$.
3. $54 - 44 = 10$ chairs.

Problem 4

1. $3 + 2 = 5$, then $4 \times 5 = 20$.
2. Available points: $100 - 20 = 80$.
3. $80 \div 5 = 16$ per team.

Problem 5

1. Bracket: $30 \div 3 = 10$.
2. Inner difference: $10 - 5 = 5$, so the box is $5 + 2 = 7$.
3. $3 \times [5 + (7 - 2)] = 30$ checks it.

Problem 6

1. Discounted ticket: $9 - 2 = 7$ dollars.
2. Four tickets: $4 \times 7 = 28$ dollars.
3. $34 - 28 = 6$ dollars too high.

Problem 7

1. Each group has $8 + 4 = 12$ guests.
2. Total: $3 \times 12 = 36$ guests.
3. $36 \div 6 = 6$ tables.

Problem 8

1. $12 \div 3 = 4$.
2. First: $2 \times (15 + 4) = 38$ items; second: $30 + 4 = 34$ items.
3. $38 - 34 = 4$ items.

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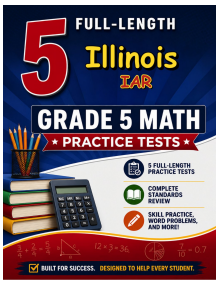

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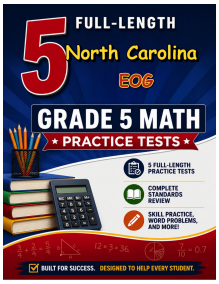

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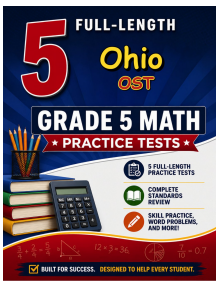

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