Evaluating Expressions with Grouping Symbols

Evaluating Expressions with Grouping Symbols: Models and Computation

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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. Evaluate $6 \times (9 - 4) + 3$.

2. Find $[24 \div (2 + 4)] + 7$.

3. Evaluate $2 \times \{15 - [3 \times (1 + 2)]\}$.

4. Compare $36 \div (3 + 3)$ with $36 \div 3 + 3$. Give both values.

5. A student evaluates $(7 + 5) \times 4$ as $7 + 20 = 27$. Correct it.

6. Fill the box: $(\square + 4) \times 3 = 27$.

7. A club buys 5 boxes, each with 8 red and 4 blue flags. Evaluate $5 \times (8 + 4)$ and give the unit.

8. Evaluate $48 \div [2 \times (5 - 1)]$.

Answer Key

1. 33.
2. 11.
3. 12.
4. 6 and 15; the second is 9 greater.
5. 48.
6. 5.
7. 60 flags.
8. 6.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Parentheses: $9 - 4 = 5$.
2. Multiply: $6 \times 5 = 30$.
3. Add: $30 + 3 = 33$.

Problem 2

1. Inner group: $2 + 4 = 6$.
2. Bracket: $24 \div 6 = 4$.
3. $4 + 7 = 11$.

Problem 3

1. $1 + 2 = 3$, then $3 \times 3 = 9$.
2. Braces: $15 - 9 = 6$.
3. $2 \times 6 = 12$.

Problem 4

1. Grouped: $3 + 3 = 6$ and $36 \div 6 = 6$.
2. Ungrouped: $36 \div 3 = 12$, then $12 + 3 = 15$.
3. $15 - 6 = 9$.

Problem 5

1. Parentheses first: $7 + 5 = 12$.
2. $12 \times 4 = 48$.
3. $7 + 5 \times 4 = 27$ is a different expression without the original grouping.

Problem 6

1. Undo multiplication: $27 \div 3 = 9$.
2. Undo addition: $9 - 4 = 5$.
3. Check: $(5 + 4) \times 3 = 27$.

Problem 7

1. Flags per box: $8 + 4 = 12$.
2. All boxes: $5 \times 12 = 60$ flags.
3. Check by colors: $40 + 20 = 60$ flags.

Problem 8

1. $5 - 1 = 4$.
2. $2 \times 4 = 8$.
3. $48 \div 8 = 6$.

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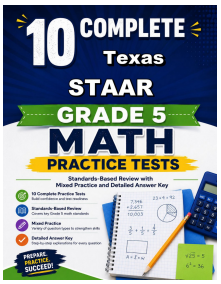

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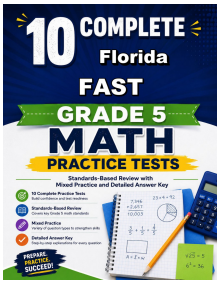

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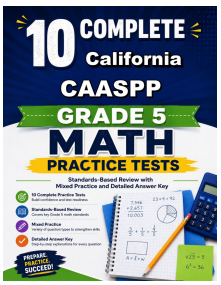

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