Writing and Interpreting Numerical Expressions

Writing and Interpreting Numerical Expressions: Find, Fix, and Work Backward

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

QUICK REVIEW

Translate the structure before calculating. “Three times the sum of 4 and 5” is $3 \times (4 + 5) = 27$. “Five more than three times 4” is $3 \times 4 + 5 = 17$. The grouping changes what gets multiplied.

Worked example

Write an expression for: four times the sum of 9 and 2. Then evaluate it.

1. The sum is $9 + 2 = 11$, so group it.
2. $4 \times 11 = 44$.
Answer: $4 \times (9 + 2) = 44$.

Practice Problems

Show your thinking.

1. For five times the sum of 6 and 4, a student writes $5 \times 6 + 4$. Explain the mistake and give the correct value.

2. Two students represent dividing the difference of 42 and 18 by 6: one writes $(42 - 18) \div 6$, the other $42 - 18 \div 6$. Which matches? Evaluate both.

3. Find the number in $4 \times (7 + \square) = 48$. How does grouping help you find it?

4. A classmate says moving parentheses never changes subtraction. Test $(18 - 4) - 3$ and $18 - (4 - 3)$.

5. Choose $+, -, \times$, or $\div$ to make $30 \; \square \; (6 + 4) = 3$ true.

6. Do $4(5 + 2)$ and $4 \times 5 + 4 \times 2$ describe the same total? Explain using groups.

7. A library shares 96 books equally among four shelves with three sections each. Choose $96 \div (4 \times 3)$ or $96 \div 4 \times 3$ for books per section. Explain.

8. Add parentheses to $2 + 3 \times 7$ so the result is 35. Explain why the original does not work.

Answer Key

1. $5 \times (6 + 4) = 50$, not 34.
2. The first; it gives 4. The second gives 39.
3. 5.
4. False. The first is 11 and the second is 17.
5. Use division: $30 \div (6 + 4) = 3$.
6. Yes; both equal 28.
7. $96 \div (4 \times 3) = 8$ books per section.
8. $(2 + 3) \times 7 = 35$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. $5 \times 6 + 4 = 30 + 4 = 34$ multiplies only the six.
2. The words require multiplying the whole sum, $6 + 4 = 10$.
3. Use $5 \times (6 + 4) = 5 \times 10 = 50$.

Problem 2

1. The first divides the full difference: $(42 - 18) \div 6 = 24 \div 6 = 4$.
2. The second divides only 18 first: $42 - (18 \div 6) = 42 - 3 = 39$.
3. Only the first divides the entire difference.

Problem 3

1. Each of the four groups must total $48 \div 4 = 12$.
2. The group starts with 7, so the missing amount is $12 - 7 = 5$.
3. Check: $4 \times (7 + 5) = 48$.

Problem 4

1. First: $18 - 4 = 14$; then $14 - 3 = 11$.
2. Second: $4 - 3 = 1$; then $18 - 1 = 17$.
3. Because $11 \neq 17$, the regrouping changed the value.

Problem 5

1. The parentheses equal 10.
2. Adding, subtracting, or multiplying gives $40, 20$, or 300, not 3.
3. $30 \div 10 = 3$, so only division works.

Problem 6

1. The first makes four groups of $5 + 2 = 7$, giving $4 \times 7 = 28$.
2. The second counts all the fives and all the twos separately: $20 + 8 = 28$.
3. Both count the same items in the four groups.

Problem 7

1. There are $4 \times 3 = 12$ sections, so the divisor must be the whole product.
2. $96 \div 12 = 8$ books per section.
3. The other expression divides by four and then multiplies by three, giving 72, not the share of one section.

Problem 8

1. Without parentheses, $3 \times 7 = 21$ comes first, and $2 + 21 = 23$.
2. To make 35 with a factor of 7, the other factor must be $35 \div 7 = 5$.
3. Group $2 + 3$ to get that five: $(2 + 3) \times 7 = 35$.

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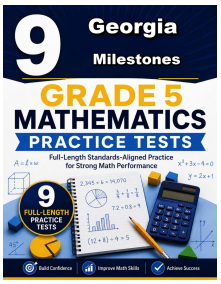

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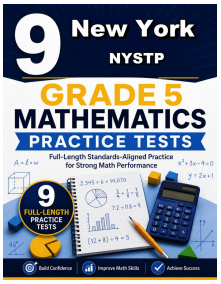

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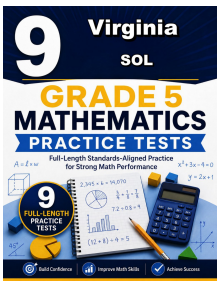

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