Evaluating Expressions

Evaluating expressions: Mistakes and missing information

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

QUICK REVIEW

Substitute the value for every occurrence of each variable, then follow the order of operations. At $x = 3, y = 2$, $4x + y^2 = 4(3) + 2^2 = 12 + 4 = 16$. Use parentheses for a negative input: if $x = -4$, then $x^2 = (-4)^2 = 16$.

Worked example

Substitute carefully. Evaluate $x^2 + 3x + 5$ at $x = 2$.

1. Substitute $x = 2$ to get $(2)^2 + 3(2) + 5$.
2. $(2)^2 = 4$ and $3(2) = 6$.
3. $4 + (6) + 5 = 15$.
Answer: 15.

Practice Problems

Show your thinking.

1. A student adds $5 + 2$ instead of multiplying. Correct it. Evaluate $5x + 4$ at $x = 2$.

2. A student ignores the parentheses. Repair the value. Evaluate $3(x + 2)$ at $x = 4$.

3. A student treats $(-3)^2$ as -9. Correct the evaluation. Evaluate $x^2 + 2x + 5$ at $x = -3$.

4. A student divides only 7 by 4. Evaluate the entire numerator first. Evaluate $\frac{x+7}{4}$ at $x = 9$.

5. Recover the output from this input. Evaluate $30 - 6x$ at $x = 3$.

6. Explain what survives when the input is zero. Evaluate $4x + 1$ at $x = 0$.

7. A student computes $2x + 8$. Correct the grouped expression. Evaluate $2(x + 8)$ at $x = 3$.

8. Recover the value after substitution, squaring, and multiplication. Evaluate $x^2 + 5x + 1$ at $x = 2$.

Answer Key

1. 14.
2. 18.
3. 8.
4. 4.
5. 12.
6. 1.
7. 22.
8. 15.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Substitute $x = 2$ to get $5(2) + 4$.
2. $5(2) = 10$.
3. $10 + 4 = 14$.

Problem 2

1. Substitute $x = 4$ to get $3((4) + 2)$.
2. Inside the parentheses: $4 + 2 = 6$.
3. $3 \times 6 = 18$.

Problem 3

1. Substitute $x = -3$ to get $(-3)^2 + 2(-3) + 5$.
2. Two negative factors give a positive square: $(-3)^2 = (-3)(-3) = 9$. The separate product is $2(-3) = -6$.
3. $9 + (-6) + 5 = 8$.

Problem 4

1. Substitute $x = 9$ to get $\frac{(9)+7}{4}$.
2. Numerator: $9 + 7 = 16$.
3. $16/4 = 4$.

Problem 5

1. Substitute $x = 3$ to get $30 - 6(3)$.
2. $6(3) = 18$.
3. $30 - (18) = 12$.

Problem 6

1. Substitute $x = 0$ to get $4(0) + 1$.
2. $4(0) = 0$.
3. $0 + 1 = 1$.

Problem 7

1. Substitute $x = 3$ to get $2((3) + 8)$.
2. Inside the parentheses: $3 + 8 = 11$.
3. $2 \times 11 = 22$.

Problem 8

1. Substitute $x = 2$ to get $(2)^2 + 5(2) + 1$.
2. $(2)^2 = 4$ and $5(2) = 10$.
3. $4 + (10) + 1 = 15$.

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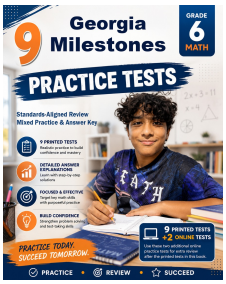

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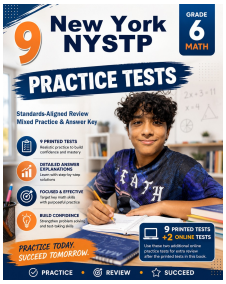

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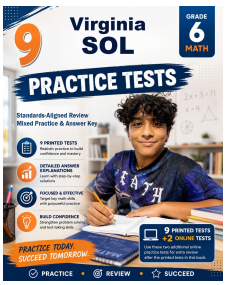

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