

Introduction to Algebra: Adding Substitution

What is Substitution in Algebra?

Substitution is a method in algebra where you replace a variable with a given value to calculate the result of an expression. This is useful for evaluating expressions and solving equations.

Example: If $x = 3$, what is the value of $2x + 5$?

Replace x with 3:

$$2 \times 3 + 5 = 6 + 5 = 11$$

Practice Questions

1. If $a = 4$, calculate the value of $3a - 2$.
2. If $y = 7$, find the value of $y^2 + 6$.
3. If $m = 2$ and $n = 5$, work out $m + 2n$.
4. If $b = 10$, what is $\frac{b}{2} + 3$?
5. If $x = -1$, calculate $4x^2 - x$.

Additional Practice Questions

6. If $k = 6$, what is the value of $5k - 9$?
7. If $t = 12$, find the value of $\frac{t}{3} + 4$.
8. If $x = 0$ and $y = 9$, calculate $2x + y$.
9. If $w = -4$, what is $w^2 + 2w$?
10. If $h = 5$, find the value of $3h^2 - h$.
11. If $z = 8$, calculate $z - 3z$.
12. If $a = 2$ and $b = 7$, what is $ab + b$?
13. If $p = 10$, find the value of $\frac{p^2}{5}$.
14. If $c = 3$, what is $2c^3 + 1$?
15. If $m = 1$ and $n = 4$, calculate $m^2 + n^2$.

Challenge Question

If $p = 3$ and $q = 8$, what is the value of $2p^2 + q - 5$?

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Answer Key

1. $3a - 2 = 3 \times 4 - 2 = 12 - 2 = 10$
2. $y^2 + 6 = 7^2 + 6 = 49 + 6 = 55$
3. $m + 2n = 2 + 2 \times 5 = 2 + 10 = 12$
4. $\frac{b}{2} + 3 = \frac{10}{2} + 3 = 5 + 3 = 8$
5. $4x^2 - x = 4 \times (-1)^2 - (-1) = 4 \times 1 + 1 = 4 + 1 = 5$
6. $5k - 9 = 5 \times 6 - 9 = 30 - 9 = 21$
7. $\frac{t}{3} + 4 = \frac{12}{3} + 4 = 4 + 4 = 8$
8. $2x + y = 2 \times 0 + 9 = 0 + 9 = 9$
9. $w^2 + 2w = (-4)^2 + 2 \times (-4) = 16 - 8 = 8$
10. $3h^2 - h = 3 \times 5^2 - 5 = 3 \times 25 - 5 = 75 - 5 = 70$
11. $z - 3z = 8 - 3 \times 8 = 8 - 24 = -16$
12. $ab + b = 2 \times 7 + 7 = 14 + 7 = 21$
13. $\frac{p^2}{5} = \frac{10^2}{5} = \frac{100}{5} = 20$
14. $2c^3 + 1 = 2 \times 3^3 + 1 = 2 \times 27 + 1 = 54 + 1 = 55$
15. $m^2 + n^2 = 1^2 + 4^2 = 1 + 16 = 17$

Challenge Question:

$$2p^2 + q - 5 = 2 \times 3^2 + 8 - 5 = 2 \times 9 + 8 - 5 = 18 + 8 - 5 = 21$$