

Algebra I Notes #1 page 1 Order of Operations Unit 1

When evaluating arithmetic expressions, if there are no parentheses, the operations must be performed in the following order.

First: Evaluate all powers or roots (left to right)

Next: Perform all multiplication and division (left to right)

Finally: Perform all addition and subtraction. (left to right)

The following examples do not have any powers or roots. In this case, look for any multiplication or division to do first.

1. $9 - 2 \cdot 3 = 9 - 6 = \underline{3}$

step 1: Do the multiplication first.

step 2: Now do the subtraction.

3. $16 + 6 \div 2 = 16 + 3 = \underline{19}$

step 1: Do the division first.

step 2: Now do the addition.

5. $24 \div 6 \div 2 = 4 \div 2 = \underline{2}$

step 1: The division is done from left to right.

7. $13 - 6 - 2 = 7 - 2 = \underline{5}$

step 1: The subtraction is done from left to right.

9. $5 \cdot 6 - 4 \div 2 = 30 - 4 \div 2 = 30 - 2 = \underline{28}$

step 1: Do the multiplication first. (Multiplication and division are done **from left to right**.)

step 2: Do the division next.

step 3: Do the subtraction.

2. $12 \div 2 \cdot 8 = 6 \cdot 8 = \underline{48}$

step 1: Do the division first. (Multiplication and division are done **from left to right**.)

step 2: Now do the multiplication.

4. $24 - 10 + 6 = 14 + 6 = \underline{20}$

step 1: Do the subtraction first. (Addition and subtraction are done **from left to right**.)

step 2: Now do the addition.

6. $20 - 12 \div 3 = 20 - 4 = \underline{16}$

step 1: Do the division first.

step 2: Now do the subtraction.

8. $6 + 3 \cdot 4 + 5 = 6 + 12 + 5 = 18 + 5 = \underline{23}$

step 1: Do the multiplication first.

step 2: Now do the addition from left to right.

10. $6 + 24 \div 3 \cdot 4 = 6 + 8 \cdot 4 = 6 + 32 = \underline{38}$

step 1: Do the division first. (Multiplication and division are done **from left to right**.)

step 2: Do the multiplication next.

step 3: Do the addition.

If parentheses are present, do the operation(s) inside them first.

11. $(5 + 7) \cdot 2 = 12 \cdot 2 = \underline{24}$

step 1: Do the addition first.

step 2: Do the multiplication.

13. $18 - (2 + 12) = 18 - 14 = \underline{4}$

step 1: Do the addition first.

step 2: Do the subtraction.

12. $12 \div (4 - 2) = 12 \div 2 = \underline{6}$

step 1: Do the subtraction first.

step 2: Do the division.

14. $(3 + 4) \cdot (2 + 6) = 7 \cdot (2 + 6) = 7 \cdot 8 = \underline{56}$

step 1: Do the addition (left to right).

step 2: Do the multiplication.

Algebra I Notes #1 page 2 Evaluating Algebraic Expressions Unit 1

Evaluating algebraic expressions involves two steps. First substitute the value of the variable(s) into the expression. Then perform the indicated operation(s). Remember, evaluate means to find the value of

Evaluate each of the following algebraic expressions for the given value of the variable.

15. Evaluate $x + 4$, if $x = 8$.

$$\begin{array}{l} x + 4 = 8 + 4 = \underline{12} \\ \text{substitute} \end{array}$$

16. Evaluate $x - 4$, if $x = 8$.

$$\begin{array}{l} x - 4 = 8 - 4 = \underline{4} \\ \text{substitute} \end{array}$$

17. Evaluate $4x$, if $x = 8$.

$$\begin{array}{l} 4x = 4 \cdot 8 = \underline{32} \\ \text{substitute} \end{array}$$

18. Evaluate $x \div 4$, if $x = 8$.

$$\begin{array}{l} x \div 4 = 8 \div 4 = \underline{2} \\ \text{substitute} \end{array}$$

19. Evaluate $2x + 7$, if $x = 3$.

$$\begin{array}{l} 2x + 7 = 2 \cdot 3 + 7 = 6 + 7 = \underline{13} \\ \text{substitute} \end{array}$$

20. Evaluate $2(x + 7)$, if $x = 3$.

$$\begin{array}{l} 2(x + 7) = 2 \cdot (3 + 7) = 2 \cdot 10 = \underline{20} \\ \text{substitute} \end{array}$$

21. Evaluate $3x - 10$, if $x = 6$.

$$\begin{array}{l} 3x - 10 = 3 \cdot 6 - 10 = 18 - 10 = \underline{8} \\ \text{substitute} \end{array}$$

22. Evaluate $3(x - 10)$, if $x = 6$.

$$\begin{array}{l} 3(x - 10) = 3 \cdot (6 - 10) = 3 \cdot -4 = \underline{-12} \\ \text{substitute} \end{array}$$