

Algebraic Expressions (Lsn5-1)

To evaluate an algebraic expression you replace each variable with its numerical value, then use the order of operations to simplify.

Example 1

Evaluate $6x - 7$ if $x = 8$.

$$\begin{aligned} 6x - 7 &= 6(8) - 7 \\ &= 48 - 7 \\ &= 41 \end{aligned}$$

Replace x with 8.
Use the order of operations.
Subtract 7 from 48.

Example 2

Evaluate $5m - 3n$ if $m = 6$ and $n = 5$.

$$\begin{aligned} 5m - 3n &= 5(6) - 3(5) \\ &= 30 - 15 \\ &= 15 \end{aligned}$$

Replace m with 6 and n with 5.
Use the order of operations.
Subtract 15 from 30.

Example 3

Evaluate $\frac{ab}{3}$ if $a = 7$ and $b = 6$.

$$\begin{aligned} \frac{ab}{3} &= \frac{(7)(6)}{3} \\ &= \frac{42}{3} \\ &= 14 \end{aligned}$$

Replace a with 7 and b with 6.
The fraction bar is like a grouping symbol.
Divide.

$$\frac{3(4)}{6} = \frac{12}{6} = 2$$

Example 4

Evaluate $x^3 + 4$ if $x = 3$.

$$\begin{aligned} x^3 + 4 &= 3^3 + 4 \\ &= 27 + 4 \\ &= 31 \end{aligned}$$

Replace x with 3.
Use the order of operations.
Add 27 and 4.

$$x^3 = x \cdot x \cdot x \quad 2^3 = 2 \cdot 2 \cdot 2 = 8$$

Exercises

Evaluate each expression if $a = 4$, $b = 2$, and $c = 7$.

1. $3ac$

2. $5b^3$
 $5(2)^3$
 $5 \cdot 2 \cdot 2 \cdot 2 = 40$
 $5 \cdot 8 = 40$

3. abc

7. $\frac{b^4}{4}$

8. $c - a$

9. $20 - bc$

13. $7c$

14. $6a - b$

15. $ab - c$

$$2c^2 = 2 \cdot c \cdot c$$