

LESSON 3

Evaluating Algebraic Expressions

HW

An algebraic expression contains at least one variable. Each variable stands for a number. When you know the numbers that each variable stands for, you can put the numbers in place of the variable and then use the order of operations to find the result. This is called *evaluating an algebraic expression*.

Algebraic Expressions

$$\frac{p}{3} - 9; \quad 8x + 12y; \quad \frac{c^2 + \sqrt{d}}{e};$$

$$a + 8 - b + (-5)^3$$

When you see a number in front of a variable, that means you should multiply the number times the variable. For example, $12y$ means that you multiply 12 times y , or $12 \times y$.

Example

Evaluate $10 + 5w$ when $w = 6$.

STEP 1 Put the number in for the variable.

$$10 + 5w \rightarrow 10 + 5 \times 6$$

$5w$ is the same as $5 \times w$.

STEP 2 Evaluate the expression.

Use the order of operations you learned in Lesson 2.

When you evaluate the expression, you do the calculations in the expression.

$$10 + 5 \times 6 = 10 + (5 \times 6) = 10 + 30 = 40$$

First multiply, then add.

$$\text{When } w = 6, 10 + 5w = 40.$$

ON YOUR OWN

Evaluate $8t - 7$ when $t = 3$.

Practice

Building Skills

Evaluate each expression when $n = 4$.

1. $3n - 6$

2. $n^3 \div (3 + 5)$

3. $4n + 7$

4. $24 - (4 \times n)$

5. $30 + (n + 7)^2$

6. $5n + (3 \times 2)$

Evaluate each expression when $n = -2$ and $m = 3$.

7. $m \times n$

8. $m \times (2 + n^2)$

9. $(m^2 + n)^2$

10. $5m + 5n - 5$

Problem Solving

Solve.

11. The number of dollars Selena has saved is expressed as $500 + 40m$, where m is the number of months since January 1, 2003. How many dollars has she saved when $m = 3$?

12. The number of hours it takes to trim trees is expressed as $1 + \frac{15}{w}$, where w is the number of workers in the crew. How many hours does it take to do the job with 5 workers?

13. The number of miles Caitlin drove during a daylong trip is expressed as $60 \times 0.9h$, where h is the number of hours on the road. How many miles had Caitlin driven after 2 hours on the road?

14. The cost of wall-to-wall carpet is expressed as $18f + 6s$, where f is the square feet of carpet and s is the number of stairs. How much does it cost to carpet 250 square feet and 6 stairs?