

1.1 Order of Operations & Formulas

- ▶ Use the order of operations to evaluate a numerical expression.
- ▶ Use a calculator to evaluate a numerical expression.
- ▶ Use the order of operations to evaluate a formula.

Order of Operations

Mathematics is a language. In this language, numbers are the nouns. The operations +, −, ×, ÷, and exponentiation are the verbs. The **order of operations** is a set of rules that tells you which operations have priority.

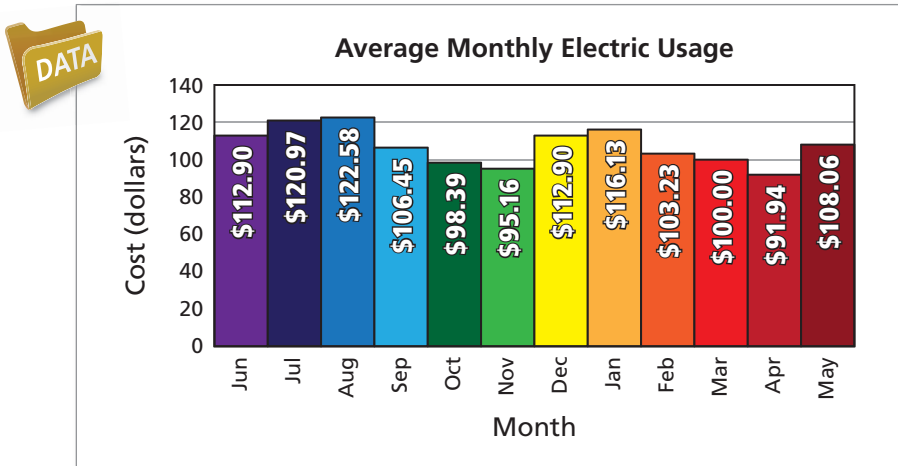
Study Tip
 A mnemonic for remembering the order of operations is "Please Excuse My Dear Aunt Sally."

Order of Operations

1. Perform operations in **P**arentheses.
2. Evaluate numbers with **E**xponents.
3. **M**ultiply or **D**ivide from left to right.
4. **A**dd or **S**ubtract from left to right.

EXAMPLE 1 Using Order of Operations

From June through April, on an equal-payment plan, you pay \$110 each month on your electric bill. How much do you owe in May?



SOLUTION

$$\begin{aligned}
 & \overbrace{(112.90 + 120.97 + 122.58 + 106.45 + 98.39 + 95.16 + 112.90)}^{\text{Amount you owe}} \\
 & \quad + 116.13 + 103.23 + 100.00 + 91.94 + 108.06 - \underbrace{11(110)}_{\text{Amount you paid}} \\
 & = 1288.71 - 11(110) \qquad \text{Add inside parentheses.} \\
 & = 1288.71 - 1210 \qquad \text{Multiply.} \\
 & = 78.71 \qquad \text{Subtract.}
 \end{aligned}$$

You owe \$78.71 in May.

✓ Checkpoint

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Suppose you paid \$95 per month. How much would you owe in May?

In 2009, the greatest consumption of electricity in the United States occurred in August. The least occurred in April.