

LESSON
1.4

Name _____ Date _____

Study Guide

For use with pages 21–27

GOAL Evaluate expressions using the order of operations.

VOCABULARY

A **numerical expression** represents a particular value. It consists of numbers and operations to be performed. An expression can also involve **grouping symbols** such as parentheses and fraction bars. You **evaluate** an expression by finding its value. Use the **order of operations** shown below when you evaluate an expression.

1. Evaluate expressions inside grouping symbols.
2. Evaluate powers.
3. Multiply and divide from left to right.
4. Add and subtract from left to right.

EXAMPLE 1 Using the Order of Operations

- | | |
|---|---|
| <p>a. $24 - 3 + 7 = 21 + 7$
 $= 28$</p> | <p>First subtract 3 from 24.
Then add 21 and 7.</p> |
| <p>b. $3 \times 8 \div 2 = 24 \div 2$
 $= 12$</p> | <p>First multiply 3 by 8.
Then divide 24 by 2.</p> |
| <p>c. $9 - 2 \times 4 + 3 = 9 - 8 + 3$
 $= 1 + 3$
 $= 4$</p> | <p>First multiply 2 by 4.
Next subtract 8 from 9.
Then add 1 and 3.</p> |

Exercises for Example 1

Evaluate the expression.

- | | |
|-------------------------|------------------------|
| 1. $6 + 2 - 5$ | 2. $8 - 4 + 7$ |
| 3. $3 \times 12 \div 2$ | 4. $3 \times 8 \div 2$ |
| 5. $10 \div 5 + 5$ | 6. $15 - 3 \times 4$ |

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EXAMPLE 2 Powers and Grouping Symbols

- a. $10 - 3^2 = 10 - 9$ First evaluate the power.
 $= 1$ Then subtract.
- b. $15 \div (4 - 1) = 15 \div 3$ First evaluate inside grouping symbols.
 $= 5$ Then divide.
- c. $\frac{14 - 2}{3 + 1} = \frac{12}{4}$ Evaluate the numerator and the denominator.
 $= 3$ Then divide.

Exercises for Example 2

7. 3×4^2 8. $2^4 - 6$ 9. $5 \times (1 + 7)$
10. $16 \div (2 + 6)$ 11. $\frac{18}{17 - 11}$ 12. $\frac{1 + 8}{2 + 1}$

EXAMPLE 3 Solving Multi-Step Problems

The school orchestra is presenting a concert. Admission is \$4 per adult and \$2 per student. If 50 adults and 35 students are admitted, what is the total dollar amount paid for admissions?

Solution

- Multiply to find the amount paid for adult admissions.
 $50 \text{ adults} \times \$4 \text{ per adult} = \$200$
- Multiply to find the amount paid for student admissions.
 $35 \text{ students} \times \$2 \text{ per student} = \70
- Add the totals paid for adult admissions and student admissions.
 $\$200 + \$70 = \$270$

Answer: The total dollar amount paid for admissions is \$270.

Exercises for Example 3

- You buy 4 notebooks for \$2 each, 5 mechanical pencils for \$3 each, and 2 binders for \$5 each. What is the total cost?
- A ski resort charges \$40 per adult and \$30 per student for a one-day pass. How much would it cost for 2 adult and 4 student one-day passes?