

## 1-3

NAME \_\_\_\_\_ DATE \_\_\_\_\_

**Order of Operations** (Pages 19–24)

Numerical and algebraic expressions often contain more than one operation. A rule is needed to let you know which operation to perform first. The rule is called the **order of operations**.

<b>Order of Operations</b>	<ol style="list-style-type: none"> <li>1. Simplify the expressions inside grouping symbols, such as parentheses ( ), brackets [ ], and braces { }, and as indicated by fraction bars.</li> <li>2. Evaluate all powers.</li> <li>3. Do all multiplications and divisions from left to right.</li> <li>4. Do all additions and subtractions from left to right.</li> </ol>
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**EXAMPLES***Evaluate each expression.*

**A**  $15 + 3 \cdot 21$

$$15 + 3 \cdot 21 = 15 + 63 \quad \text{Multiply 3 by 21.}$$

$$= 78 \quad \text{Add 15 and 63.}$$

**B**  $\frac{8 + 2^3}{(3 + 1) \cdot 2}$

Since this expression is a fraction, the numerator and denominator should each be treated as a single value. Think of the expression as  $(8 + 2^3) \div [(3 + 1) \cdot 2]$ .

$$(8 + 2^3) \div [(3 + 1) \cdot 2]$$

$$= (8 + 8) \div [4 \cdot 2] \quad \text{Evaluate } 2^3; \text{ add 3 and 1.}$$

$$= 16 \div 8 \quad \text{Add 8 and 8; multiply 4 and 2.}$$

$$= 2 \quad \text{Divide 16 by 8.}$$

**Try These Together***Evaluate each expression.*

1.  $7 \cdot 2 + 1$

2.  $2 + 3^2 \cdot 4 - 1$

3.  $3(8 + 2) \div 5 - 4$

*HINT: Refer to the order of operations above to help you remember which operations to perform first.***PRACTICE***Evaluate each expression.*

4.  $\frac{8}{4} + 3$

5.  $12 - 6 + 2 \cdot 3$

6.  $2(3 + 5) - 4$

7.  $15(2) - 6$

8.  $60 - (13 + 5)$

9.  $6 + 2(3)$

10.  $2[2(2 + 2)] + 1$

11.  $(15)(3)^2 + (4 - 2)$

12.  $2(1.5 + 2.5) + 7$

13.  $\frac{3(2^2) + 2(3^2)}{4}$

14.  $\frac{17 + 3^3 - 4(2)}{2}$

15.  $80 - (20 + 5)$

*Evaluate each expression if  $x = 5$ ,  $y = 1$ , and  $z = 3$ .*

16.  $(x + 5)(y + z)$

17.  $x(xy + z)$

18.  $2(x + y) + z$

**19. Standardized Test Practice** Evaluate the expression  $2 + (3 + 4)2 + 6 - 5(2)$ .**A** 10**B** 11**C** 12**D** 13

Answers: 1. 15 2. 37 3. 2 4. 5 5. 12 6. 12 7. 24 8. 42 9. 12 10. 17 11. 137 12. 15 13.  $7\frac{1}{4}$  14. 18 15. 55  
16. 40 17. 40 18. 15 19. C