1.2 Apply Order of Operations

Before You evaluated algebraic expressions and used exponents.

Now You will use the order of operations to evaluate expressions.

Why? So you can determine online music costs, as in Ex. 35.

KEY CONCEPT *For Your Notebook*

Order of Operations

STEP 1 **Evaluate** expressions inside grouping symbols.

STEP 2 **Evaluate** powers.

STEP 3 **Multiply** and **divide** from left to right.

STEP 4 **Add** and **subtract** from left to right.

PEMDAS

GROUPING SYMBOLS Grouping symbols such as parentheses ( ) and brackets [ ] indicate that operations inside the grouping symbols should be performed first. For example, to evaluate $2 \cdot 4 + 6$, you multiply first, then add. To evaluate $2(4 + 6)$, you add first, then multiply.

LESSON 1.2

Practice A

For use with the lesson "Apply Order of Operations"

Name the operation that would be performed first.

1. $18 - 5 + 12$ Sub.
2. $5 \cdot 8 \div 4$
3. $27 \div (14 - 5)$ Sub.
4. $36 \div 4 \cdot 3$
5. $8 + 10 \div 5 - 3$ Div.
6. $4 \cdot (7 - 3)^2$

Evaluate the expression.

7. $15 - 8 + 4$

$7 + 4$

11

8. $13 - 7 + 2$

9. $6 \cdot 4 \div 8$

$24 \div 8$

3

10. $7 \cdot 4 - 3$

11. $32 - 9 \div 3$

12. $9 + 3 \cdot 4$

$32-3$

29

13. $6(8-3)$

$6(5)$

30

14. $20+3^2$

$25-8\cdot 2$

$25-16$

9

15. $5^2-8\cdot 2$

Evaluate the expression.

16. $6x + 3$ when $x = 2$ **17.** $4b - 1$ when $b = 5$ **18.** $5 + 2m^2$ when $m = 6$

$4 \cdot 5 - 1$

$20 - 1$

19

19. $3y^2 - 2$ when $y = 1$ **20.** $5 \cdot 2a^3$ when $a = 3$ **21.** $4c^2 - 2c$ when $c = 5$

$3 \cdot 1^2 - 2$

$3 \cdot 1 - 2$

$3 - 2$

1

22. $10 + n^3$ when $n = 0.5$ **23.** $40 - \frac{32}{r}$ when $r = 4$ **24.** $x^2 \div 3 - 12$ when $x = 9$

$40 - \frac{32}{4}$

$40 - 8$

32

Was the expression evaluated correctly using the order of operations? If not, find and correct the error.

25. $8 + 3 - 2 \cdot 5 = 8 + 3 - 10 = 11 - 10 = 1$

26. $(8 + 10) \div 6 - 3 = 18 \div 6 - 3 = 18 \div 3 = 6$

27. Baseball In your last three baseball games, you scored 4 runs, 1 run, and 1 run, respectively. The average number of runs you scored for the three games is given by the expression $\frac{4 + 1 + 1}{3}$. Find the average number of runs per game.

$\frac{6}{3} = 2$

28. **Knitting** You are buying yarn for a knitting project. One skein of yarn in a basic color costs \$3.99 and one skein of yarn in a fashion color costs \$5.99. The total cost of buying 5 skeins of basic yarn and 2 skeins of fashion yarn is given by the expression $5 \cdot 3.99 + 2 \cdot 5.99$. Find the total cost of the yarn.

$19.95 + 11.98$

31.93

29. Desk Lamp You are buying a desk lamp for your study area. The lamp is \$32 but is on sale for 75% of the original price. If you pay 5% sales tax, the expression $1.05(0.75 \cdot 32)$ represents the total cost of the lamp. Find the total cost of the lamp.

$1.05(24)$

$1.05(24)$

$\$25.20$

30. Bowling A local bowling alley charges \$4.50 to play one game and \$4 to rent one pair of shoes. The expression $4.5g + 4$ represents the total cost for you to play g games. How much would it cost you to bowl 4 games?

$4.5 \cdot 4 + 4$

$18 + 4$

\$22