1-6 Exercises

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GUIDED PRACTICE

1. Vocabulary Explain why the *order of operations* is necessary for simplifying numerical expressions.

SEE EXAMPLE 1
p. 40

Simplify each expression.

2. $5 - 12 \div (-2)$

3. $30 - 5 \cdot 3$

4. $50 - 6 + 8$

5. $12 \div (-4)(3)$

6. $(5 - 8)(3 - 9)$

7. $16 + \left[5 - \left(3 + 2^2\right)\right]$

SEE EXAMPLE 2
p. 41

Evaluate each expression for the given value of the variable.

8. $5 + 2x - 9$ for $x = 4$

9. $30 \div 2 - d$ for $d = 14$

10. $51 - 91 + g$ for $g = 20$

11. $2(3 + n)$ for $n = 4$

12. $4(b - 4)^2$ for $b = 5$

13. $12 + \left[20(5 - k)\right]$ for $k = 1$

SEE EXAMPLE 3
p. 41

Simplify each expression.

14. $24 \div |4 - 10|$

15. $4.5 - \sqrt{2(4.5)}$

16. $5(2) + 16 \div |-4|$

17. $\dfrac{0 - 24}{6 + 2}$

18. $\dfrac{2 + 3(6)}{2^2}$

19. $-44 \div \sqrt{12 \div 3}$

SEE EXAMPLE 4
p. 42

Translate each word phrase into a numerical or algebraic expression.

20. 5 times the absolute value of the sum of s and -2

21. the product of 12 and the sum of -2 and 6

22. 14 divided by the sum of 52 and -3

SEE EXAMPLE 5
p. 42

23. Geometry The surface area of a cylinder can be found using the expression $2\pi r(h + r)$. Find the surface area of the cylinder shown. (Use 3.14 for π and give your final answer rounded to the nearest tenth.)

$r = 3$ ft

$h = 7$ ft
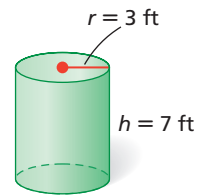
PRACTICE AND PROBLEM SOLVING

Independent Practice

For Exercises	See Example
24–32	1
33–41	2
42–49	3
50–53	4
54	5

Extra Practice

Skills Practice p. S5

Application Practice p. S28

Simplify each expression.

24. $3 + 4(-5)$

25. $20 - 4 + 5 - 2$

26. $41 + 12 \div 2$

27. $3(-9) + (-2)(-6)$

28. $10^2 \div (10 - 20)$

29. $(6 + 2 \cdot 3) \div (9 - 7)^2$

30. $-9 - (-18) + 6$

31. $15 \div (2 - 5)$

32. $5(1 - 2) - (3 - 2)$

Evaluate each expression for the given value of the variable.

33. $-6(3 - p)$ for $p = 7$

34. $5 + (r + 2)^2$ for $r = 4$

35. $13 - \left[3 + (j - 12)\right]$ for $j = 5$

36. $(-4 - a)^2$ for $a = -3$

37. $7 - (21 - h)^2$ for $h = 25$

38. $10 + \left[8 \div (q - 3)\right]$ for $q = 2$

39. $(4r - 2) + 7$ for $r = 3$

40. $-2(11b - 3)$ for $b = 5$

**41.** $7x(3 + 2x)$ for $x = -1$

Simplify each expression.

42. $-4|2.5 - 6|$

43. $\dfrac{8 - 8}{2 - 1}$

44. $\dfrac{3 + |8 - 10|}{2}$

45. $\sqrt{3^2 - 5} \div 8$

46. $\dfrac{-18 - 36}{-9}$

47. $\dfrac{6|5 - 7|}{14 - 2}$

48. $\sqrt{5^2 - 4^2}$

49. $(-6 + 24) \div |-3|$

Translate each word phrase into a numerical or an algebraic expression.

50. the product of 7 and the sum of 2 and d

51. the difference of 3 and the quotient of 2 and 5

52. the square root of the sum of 5 and -4

53. the difference of 8 and the absolute value of the product of 3 and 5

54. **Geometry** The perimeter of a rectangle can be found using the expression $2(\ell + w)$. Find the perimeter of the rectangle shown.
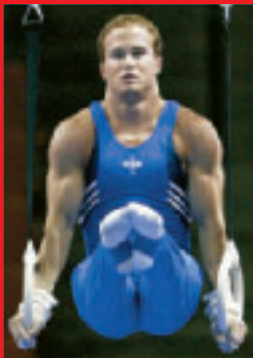
$w = 4$ in.

$\ell = 8$ in.
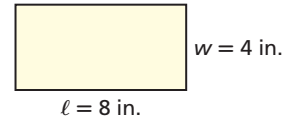
55. Simplify each expression.

   a. $50 + 10 \div 2$ **b.** $50 \cdot 10 - 2$ **c.** $50 \cdot 10 \div 2$

   d. $50 \div 10 \cdot 2$ **e.** $50 - 10 \cdot 2$ **f.** $50 + 10 \cdot 2$

Translate each word phrase into a numerical or algebraic expression.

56. the difference of 8 and the product of 4 and n

57. 2 times the sum of 9 and the opposite of x

58. two-thirds of the difference of -2 and 8

59. the square root of 7 divided by the product of 3 and 10

Sports At the 2004 Summer Olympics, U.S. gymnast Paul Hamm received the scores shown in the table during the individual all-around competition.

| 2004 Summer Olympics Individual Scores for Paul Hamm						
Event	Floor	Pommel horse	Rings	Vault	Parallel bars	Horizontal bar
Score	9.725	9.700	9.587	9.137	9.837	9.837

   a. Write a numerical expression to show the average of Hamm's scores. (*Hint:* The average of a set of values is the sum of the values divided by the number of values.)

   b. Simplify the expression to find Hamm's average score.

61. **Critical Thinking** Are parentheses required when translating the word phrase "the sum of 8 and the product of 3 and 2" into a numerical phrase? Explain.

Translate each word phrase into a numerical expression. Then simplify.

62. the sum of 8 and the product of -3 and 5

63. the difference of the product of 3 and 5 and the product of 6 and 2

64. the product of $\frac{2}{3}$ and the absolute value of the difference of 3 and -12
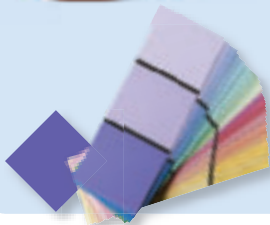
65. This problem will prepare you for the Multi-Step Test Prep on page 60.

   a. Find the area of each face of the prism. Find the sum of these areas to find the total surface area of the prism.

   b. The total surface area of a prism is described by the expression $2(\ell w) + 2(\ell h) + 2(wh)$. Explain how this expression relates to the sum you found in part **a.**

   c. Use the expression above to find the total surface area of the prism. Explain why your answers to parts **a** and **c** should be equal.

3 in.

4 in.

5 in.