

EXERCISES

 For more practice, see *Extra Practice*.

A Practice by Example

Example 1
(page 40)

Write using exponents.

1. $4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$ 2. $6 \cdot 6 \cdot 6 \cdot 11$ 3. $5 \cdot 5 \cdot x \cdot x \cdot x \cdot y$
4. $9 \cdot a \cdot a \cdot b \cdot c \cdot c \cdot c$ 5. $m \cdot p \cdot m \cdot p \cdot p$ 6. $7 \cdot w \cdot t \cdot 7 \cdot t$

Examples 2, 3
(pages 40, 41)

Simplify each expression.

7. $(-2)^4$ 8. -2^4 9. -8^2 10. $(-8)^2$ 11. $(-7)^3$
12. -7^3 13. -15^2 14. $(-15)^2$ 15. -2^4 16. -4^2
17. $(-3)^2 + 12 \cdot 4$ 18. $-3^2 + 12 \cdot 5$ 19. $(3 \cdot 2)^2 + 5$
20. $3^2 \cdot 2 + 5$ 21. $4 + (8 - 6)^2$ 22. $4 + 8 - 6^2$


Example 4
(page 41)

Evaluate each expression for $x = 2$.

23. $5x^2$ 24. $(-3x)^2$ 25. $2x^3$ 26. $(4x)^2$ 27. $-6x^3$
28. $-x^2 + 3$ 29. $6x^3 - 20$ 30. $x^4 - 17$ 31. $23 - 3x^4$ 32. $x^2 + x^3$

Example 5
(page 41)


33. **Geometry** The formula for the area of a square is $A = s^2$. What is the area of a square whose sides measure 12 cm?

-  34. **Skydiving** The distance a skydiver falls before opening her parachute depends on how long she waits. Ignoring air resistance, the formula $d = 16t^2$, where $d =$ distance in feet and $t =$ seconds in free fall, relates the distance to time. How far does a skydiver fall in 3 seconds?

B Apply Your Skills

Evaluate each expression for $n = -3$.

35. $n^2 - 2n + 16$ 36. $5n^2 - (n - 3)^2$ 37. $5(2n - 3)^2$
38. $20n^2 + 3n^3$ 39. $\frac{n^2 + 9}{n^2}$ 40. $(4n)^2 - 24 \div (-4n)$

-  41. **Model Rockets** You can use the formula $h = 160t - 32t^2$ to estimate the number of feet a model rocket rises in t seconds. How high is a rocket 2 seconds after takeoff?

42. **Writing in Math** Explain why $3^4 \neq 4^3$.

Complete each sentence with the correct base or exponent.

43. $64 = 8^{\square}$ 44. $81 = 9^{\square} = 3^{\square}$ 45. $16 = \square^2 = \square^4$

Estimation Estimate the value of each expression.

46. $3 + 2p^2$ for $p = 4.3$ 47. $z^2 - 4z^3$ for $z = 5.1$
48. $3n^3 + 2n$ for $n = -1.9$ 49. $5r^3 - 4r$ for $r = 0.2$

