

## CHAPTER TEST B



# Exponents

**25**Suggested Time:  
30 min**Concepts and Skills** (10 × 1 point = 10 points)**Write the prime factorization of each number in exponential notation.**

1. 4,725

2. 65,520

**Expand and evaluate each expression.**

3.  $(-1.1)^3$

4.  $\left(-\frac{2}{5}\right)^4$

**Evaluate each expression.**

5.  $8 \cdot 10^5 + 4 \cdot 10^1 + 9 \cdot 10^{-1}$

6.  $\frac{(35^{-2})^{-4} \cdot 7^0}{(5^3 \cdot 5^5)^{-7} \cdot 7^6}$

**Simplify each expression.**

7.  $63p^8q \div 7p^{-4}q^5$

8.  $14x^{-3}y^5 \cdot 3x^6y^4$

**Solve each equation.**

9.  $x^2 = 361$

10.  $x^3 = -\frac{64}{512}$

**Problem Solving** (Questions 11 and 12:  $2 \times 2$  points = 4 points,  
Questions 13 and 14:  $2 \times 3$  points = 6 points,  
Questions 15 and 16:  $2 \times 2$  points = 4 points,  
Question 17: 1 point)

**Solve. Show your work.**

11. Given the expressions:

$$10,000, \sqrt[3]{1,000,000}, \text{ and } \sqrt{1,000,000}$$

a) Write each number as 10 raised to a power.

b) Order the expressions from greatest to least.

12. At 9 A.M. there are 6 visitors at an exhibit. The number of visitors triples every hour until noon. How many visitors are at the exhibit at noon?  
Write your answer in exponential notation.

13. Evaluate the expressions  $7^{-3}$  and  $(-7)^3$ . Then determine which number has the least value.

14. Stella plans to tile a square floor using square-shaped tiles. Each tile has an area of 400 square centimeters. If she needs 225 tiles to completely cover the floor, what is the length of the floor?

15. The side length of a cube is  $3k$  millimeters. If the cube has a volume of 3,375 cubic millimeters, find the value of  $k$ .

**16.** A spherical sculpture has a surface area of  $256\pi$  square feet.

**a)** Use the formula  $A = 4\pi r^2$  to find the radius of the sculpture.

**b)** What is the volume of the sculpture in terms of  $\pi$ ?

**17.** A business deposits \$1,000,000 into a holding account. Three years later, there was \$1,728,000 in the account. Use the formula  $A = P(1 + r)^n$  to find the rate of interest that the investment earned.  $A$  represents the final amount of investment,  $P$  is the original principal,  $r$  is the interest rate, and  $n$  is the number of years of investment.