

# Lesson 2 Homework Practice

## Powers and Exponents

Write each expression using exponents.

1.  $3 \cdot 3 \cdot m$   
 $3^2 m$
2.  $(\frac{1}{4})(\frac{1}{4})(\frac{1}{4})$   $(\frac{1}{4})^3$
3.  $2 \cdot d \cdot 5 \cdot d \cdot d \cdot 5$   
 $2 \cdot 5^2 d^3$
4.  $p \cdot (-9) \cdot p \cdot (-9) \cdot p \cdot q \cdot q$   
 $(-9)^2 p^3 q^2$
5.  $g \cdot (-7) \cdot (-7) \cdot g \cdot h \cdot (-7) \cdot h$   
 $(-7)^3 g^2 h^2$
6.  $x \cdot \frac{1}{8} \cdot x \cdot x \cdot y \cdot \frac{1}{8} \cdot y \cdot x$   
 $(\frac{1}{8})^2 x^4 y^2$

Notation: #s first least to greatest, variables alphabetically

Evaluate each expression.

7.  $(-8)^4$   
 $4,096$
8.  $(\frac{1}{5})^3$   
 $\frac{1^3}{5^3} = \frac{1}{125}$
9.  $(-\frac{3}{5})^5$   
 $-\frac{3^5}{5^5} = -\frac{243}{3125}$
10.  $(-2)^3 + 5^2$   
 $-8 + 25 = 17$
11.  $3^4 - 5^2$   
 $81 - 25 = 56$
12.  $(-2)^5 - (-2)^4$   
 $-32 - 16 = -48$
13.  $4^3 \div 2^3$   
 $64 \div 8 = 8$
14.  $5^3 \cdot 2^3$   
 $125 \cdot 8 = 1000$
15.  $1^7 + (-3)^4$   
 $1 + 81 = 82$

ALGEBRA Evaluate each expression.

16.  $r^3 - s$ , if  $r = 5$  and  $s = 4$   $5^3 - 4 = 121$
17.  $m^2 - n^3$ , if  $m = 6$  and  $n = 2$   $6^2 - 2^3 = 28$
18.  $f - g^4$ , if  $f = 3$  and  $g = -5$   
 $3 - (-5)^4 = -622$
19.  $(x^5 - y^2)^2 + x^3$ , if  $x = 2$  and  $y = 8$   
 $(2^5 - 8^2)^2 + 2^3 = (-32)^2 + 8 = 1024 + 8 = 1032$
20. Replace  $\square$  with  $<$ ,  $>$ , or  $=$  to make a true statement:  $2^4 \square 4^2$   
 $16 = 16$

21. ISLANDS Florida has about  $2^2 \cdot 3^2 \cdot 5^3$  islands (over 10 acres). About how many islands is this?

$4 \cdot 9 \cdot 125 = 4500$   
about 4,500 islands

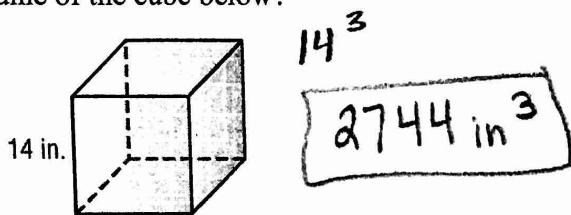
★ Answer in words (label)

# Lesson 2 Problem-Solving Practice

## Powers and Exponents

label answers

1. **GEOMETRY** The volume of a cube can be found by raising the side length to the third power. What is the volume of the cube below?



2. **SPORTS** In the first round of a local tennis tournament, there are  $2^5$  matches. Find the number of matches.

$2^5$

32 matches

3. **PALM TREES** There are about  $2^3 \cdot 3 \cdot 5^3$  species of palm trees in the whole world. About how many species is this?

$8 \cdot 3 \cdot 125$

About 3000 species

4. **NATURE** A forest fire affected about  $3^4 \cdot 10^4$  acres of land. About how many acres did the fire affect?

$81 \cdot 10000$

about 810,000 acres

5. **BIOLOGY** A scientist estimates that after a certain amount of time, there would be  $2^5 \cdot 3^3 \cdot 10^5$  bacteria in a Petri dish. About how many bacteria is this?

$32 \cdot 9 \cdot 100000$

about 86400000 bacteria

6. **ACTIVISM** A total of  $5^4 \cdot 7^3$  people have signed a petition. How many people signed the petition?

$625 \cdot 343$

214,375 people

7. **MEASUREMENT** There are  $10^6$  millimeters in one kilometer. The distance from Dana's house to her uncle's house is  $4^4$  kilometers. What is this distance in millimeters?

$4^4 \cdot 10^6$

$256 \cdot 1000000$

256,000,000 millimeters

8. **DOGS** Dedra's dog weighs  $5 \cdot 2^4$  pounds. What is the weight of Dedra's dog?

$5 \cdot 16$

80 pounds