

# Practice

KEY

Evaluate each expression. Leave your answer in exponential form.

1.  $3^4 \times 3^2$   
3<sup>6</sup>

2.  $9^7 \times 9^3$   
9<sup>10</sup>

3.  $6^3 \times 6^3$   
6<sup>6</sup>

REMEMBER You can multiply exponential expressions with like bases by adding the exponents.

4.  $5^5 \times 5^4$   
5<sup>9</sup>

5.  $1^{11} \times 1^{-9}$   
1<sup>2</sup>

6.  $x^3 \times x^{-6}$   
 $x^{-3} = \frac{1}{x^3}$

7.  $\frac{4^9}{4^7}$   
4<sup>2</sup>

8.  $\frac{2^{-10}}{2^4}$   $\frac{-10-4}{2} = \frac{-14}{2} = -7$   
2<sup>-7</sup>

9.  $\frac{z^{20}}{z^{10}}$   
z<sup>10</sup>

Complete each sentence.

10. To evaluate  $(4^3)^4$ , I need to multiply the exponents.  $4^{12}$

11. To evaluate  $\frac{10^6}{10^4}$ , I need to subtract the exponents.  $10^2$

12. To evaluate  $p^{-2} \times p^9$ , I need to add the exponents.  $p^7$

Evaluate each expression. Write your answer in standard form.

13.  $2^2 \times 2^3$   
2<sup>5</sup> = 32

14.  $3^3 \times 3^2$   
3<sup>5</sup> = 243

15.  $\frac{6^7}{6^5}$   
6<sup>2</sup> = 36

16.  $\frac{9^9}{9^8}$   
9<sup>1</sup> = 9

17.  $(\frac{1}{4})^3$   
 $(\frac{1}{4})(\frac{1}{4})(\frac{1}{4})$   
 $\frac{1}{64}$

18.  $(\frac{4}{9})^2$   
 $(\frac{4}{9})(\frac{4}{9})$   
 $\frac{16}{81}$

8/3

Evaluate each expression. Write your answer in standard form. Justify each answer.

19.  $5^{10} \times 5^{-7}$   
 $5^3$

125

20.  $7^{-4} \times 7^6$   
 $7^2$

49

21.  $\frac{2^{-5}}{2^{-8}}$   $-5 + (+8)$   
 $2 = 2^3$

8

22.  $\frac{10^{-11}}{10^{-10}}$   $-11 + (+10)$   $-1$   
 $10 = 10^{-1}$

$\frac{1}{10}$

23.  $1^{17} \times 1^{-8}$   
 $1^9$

1

24.  $\left(\frac{2}{3}\right)^{-3}$   $\left(\frac{2^{-3}}{3^{-3}}\right) = \frac{3^3}{2^3}$

$\frac{27}{8}$

Choose the best answer.

25. Which expression is equal to  $\frac{13^{-11}}{13^{-12}}$ ?

A.  $13^{-23}$

B.  $13^{-1}$

**C. 13**

D.  $13^{132}$

$13^{-11 + (+12)} = 13^1$

26. Which expression is equal to  $(5^4)^{-3}$ ?

**A.  $5^{-12}$**

B.  $5^{-7}$

C. 5

D.  $5^{12}$

$5^{-12} = \frac{1}{5^{12}}$

27. **RESTATE** In your own words, explain how you know that  $(d^6)^2$  is equal to  $d^{12}$ .

$d^6 \cdot d^6 = d^{12}$

Laws of Exponents