

## Diagnostic: Evaluate Powers

**Simplify.**

1)  $3^3 \cdot 3^3$

2)  $7 \cdot 7^3$

3)  $2 \cdot 2^4$

4)  $4^2 \cdot 4^4$

5)  $8 \cdot 8^3$

6)  $\frac{4^3}{4}$

7)  $\frac{7^4}{7^4}$

8)  $\frac{2^4}{2^2}$

9)  $\frac{4^2}{4}$

10)  $\frac{7^3}{7^2}$

## Answers to Diagnostic: Evaluate Powers

1)  $3^6 = 729$

2)  $7^4 = 2,401$

3)  $2^5 = 32$

4)  $4^6 = 4,096$

5)  $8^4 = 4,096$

6)  $4^2 = 16$

7) 1

8)  $2^2 = 4$

9) 4

10) 7

①  $3^3 \cdot 3^3 = (3 \cdot 3 \cdot 3)(3 \cdot 3 \cdot 3) = 3^6$

②  $7^1 \cdot 7^3 = 7 \cdot 7 \cdot 7 \cdot 7 = 7^4$

③  $2^1 \cdot 2^4 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5$

④  $4^2 \cdot 4^4 = (4 \cdot 4) \cdot (4 \cdot 4 \cdot 4 \cdot 4) = 4^6$

⑤  $8^1 \cdot 8^3 = 8 \cdot 8 \cdot 8 \cdot 8 = 8^4$

⑥  $\frac{4^3}{4} = \frac{\cancel{4} \cdot 4 \cdot 4}{\cancel{4}} = \frac{1 \cdot 4 \cdot 4}{1} = \frac{4 \cdot 4}{1} = 4^2$

⑦  $\frac{7^4}{7^4} = \frac{\cancel{7} \cdot \cancel{7} \cdot \cancel{7} \cdot \cancel{7}}{\cancel{7} \cdot \cancel{7} \cdot \cancel{7} \cdot \cancel{7}} = \frac{1 \cdot 1 \cdot 1 \cdot 1}{1 \cdot 1 \cdot 1 \cdot 1} = \frac{1}{1} = 1$  (OR)   
 Any term divided by itself equals one.

⑧  $\frac{2^4}{2^2} = \frac{\cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2}{\cancel{2} \cdot \cancel{2}} = \frac{1 \cdot 1 \cdot 2 \cdot 2}{1 \cdot 1} = \frac{2 \cdot 2}{1} = 2^2$

⑨  $\frac{4^2}{4} = \frac{\cancel{4} \cdot 4}{\cancel{4}} = \frac{1 \cdot 4}{1} = \frac{4}{1} = 4$

⑩  $\frac{7^3}{7^2} = \frac{\cancel{7} \cdot \cancel{7} \cdot 7}{\cancel{7} \cdot \cancel{7}} = \frac{1 \cdot 1 \cdot 7}{1 \cdot 1} = \frac{7}{1} = 7$