

Write each expression using exponents.

1. $5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5$

$$5^7$$

2. $(-2) \cdot (-2) \cdot (-2) \cdot (-2)$

$$(-2)^4$$

3. $m \cdot m \cdot m \cdot m \cdot (-y) \cdot (-y) \cdot (-y)$

$$m^4(-y)^3$$

4. $(z-4) \cdot (z-4)$

$$(z-4)^2$$

Evaluate each expression.

5. 7^3

$$\begin{array}{r} 49 \\ \times 7 \\ \hline 343 \end{array}$$

$$7 \cdot 7 \cdot 7$$

$$49 \cdot 7 = 343$$

$$\begin{array}{r} 316 \\ \times 16 \\ \hline 196 \\ +1600 \\ \hline 256 \end{array}$$

6. $(-4)^5$

$$\begin{array}{r} 256 \\ \times 4 \\ \hline 1024 \end{array}$$

$$(-4) \cdot (-4) \cdot (-4) \cdot (-4) \cdot (-4)$$

$$16 \cdot 16 \cdot (-4)$$

$$256 \cdot (-4) = -1024$$

7. $7^2 \cdot 5$

$$7 \cdot 7 \cdot 5$$

$$49 \cdot 5 = 245$$

$$\begin{array}{r} 25 \\ \times 25 \\ \hline 125 \\ +500 \\ \hline 625 \end{array}$$

8. $\left(\frac{1}{5}\right)^4$

$$\frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} = \frac{1}{625}$$

Write each expression using positive exponents.

9. $6^{-4} = \frac{1}{1296}$

$$\frac{1}{6^4} = \frac{1}{6 \cdot 6 \cdot 6 \cdot 6}$$

$\downarrow \quad \downarrow$
 $36 \cdot 36$
 \downarrow
 1296

10. $(-7)^{-5} = \frac{1}{-16807}$

$$\frac{1}{(-7)^5} = \frac{1}{(-7) \cdot (-7) \cdot (-7) \cdot (-7) \cdot (-7)}$$

$\downarrow \quad \downarrow \quad \downarrow$
 $49 \cdot 49 \cdot (-7)$
 \downarrow
 -16807

11. $b^{-6} = \frac{1}{b^6}$

12. $n^{-1} = \frac{1}{n}$

13. $(2m)^{-2} = \frac{1}{4m^2}$

$$\frac{1}{(2m)^2} = \frac{1}{2m \cdot 2m}$$

$$= \frac{1}{4m^2}$$

14. $mp^{-2} = \frac{m}{p^2}$

$$\frac{m}{p^2}$$

15. $-3^{-1} = \frac{1}{-3}$

$$\frac{1}{-3}$$