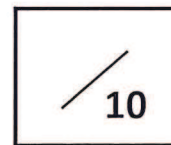


Chapter 1 Exponents

Review



1. Complete the following table.

	Power	Base	Exponent	Repeated Multiplication	Standard Form (Evaluate)
a.	2^6	2	6	$2 \times 2 \times 2 \times 2 \times 2 \times 2$	64
b.	-4^4	4	4	$-(4 \times 4 \times 4 \times 4)$	-256
c.	$(-5)^3$	-5	3	$(-5) \times (-5) \times (-5)$	-125
d.	10^5	10	5	$10 \times 10 \times 10 \times 10 \times 10$	100000

2. Write each of the following as a single power.

a. $3^4 \times 3^7 \times 3^2 \times 3^1$

3^{14}

e. $(-4m^5)^3$

$-64m^{15}$

b. $(-6)^{11} \div (-6)^5 \div (-6)^3$

$(-6)^6 \div (-6)^3 = (-6)^3$

f. $(-239n^{14}k^{33})^0$

1

c. $r^3 r^5$

r^8

g. $(w^5)^3 (w^2)^4 (w^3)$

$= w^{15} \cdot w^8 \cdot w^3$

$= w^{23} w^3 = w^{26}$

d. $m^2 m^2 m^3$

$m^4 m^3 = m^7$

h. $\frac{(x^2)^6 x^7}{x^4 (x^3)^2} = \frac{x^{12} x^7}{x^4 x^6} = \frac{x^{19}}{x^{10}}$

$= x^9$

3. Write the following numbers using powers of 10.

a. 4729

$(4 \times 10^3) + (7 \times 10^2) + (2 \times 10^1) + (9 \times 10^0)$

b. 300028

$(3 \times 10^5) + (2 \times 10^1) + (8 \times 10^0)$

4. Evaluate.

a. $(-4)^3$

$$-64$$

b. -5^2

$$-25$$

c. $-(-12)^0$

$$-1$$

d. $(-6)^4$

$$1296$$

5. Simplify, then evaluate.

a. $\frac{10^4}{10^3} = 10^1 = 10$

d. $(-3)^4 + (-3)^3 \cdot (-3)^2$

$$(-3)^4 + (-3)^5$$

$$81 + (-243) = -162$$

b. $(3 \times 2)^3$

$$6^3 = 216$$

e. $2(3 - 4 \cdot 2)^2$

$$= 2(3 - 8)^2$$

$$= 2(-5)^2$$

$$= 2(25) = 50$$

c. $-5 \cdot 3^3$

$$-5 \cdot 27 = -135$$

f. $(-5)^2 \cdot (-5)^1 + (-5)^0 \cdot (-5)^6 \div (-5)^2$

$$= (-5)^3 + (-5)^0 \cdot (-5)^6 \div (-5)^2$$

$$= (-5)^3 + (-5)^6 \div (-5)^2$$

$$= (-5)^3 + (-5)^4$$

$$= -125 + 625 = 500$$

6. Write as a power of 10.

a. ten thousand

$$10000 = 10^4$$

b. 10 000 000 000

$$10^{10}$$

c. $10 \times 10 \times 10 \times 10 \times 10$

$$10^5$$

d. $-(-1)$

$$-(-10^0)$$

7. Why is the value of $[(-3)^3]^2$ positive and the value of $[(-3)^3]^3$ negative?

$$(-3)^6 \uparrow \text{ vs. } (-3)^9 \uparrow$$

even = positive. odd = negative

8. Evaluate.

a. $[5 - (-4)]^3 - (21 \div 7)^4$

$$\begin{aligned} & [9]^3 - (3)^4 \\ & = 729 - 81 \\ & = 648 \end{aligned}$$

b. $[(6 - 21^3 \times (2 + 2)^6)]^0$

|

c. $6 \div (-2) + (2 \times 3)^2$

$$\begin{aligned} & 6 \div (-2) + (6)^2 \\ & 6 \div (-2) + 36 \\ & -3 + 36 = 33 \end{aligned}$$

d. $2^3 \times 2^2 - 2^0 + 2^4 \div 2^3$

$$\begin{aligned} & = 2^5 - 2^0 + 2^4 \div 2^3 \\ & = 2^5 - 2^0 + 2^1 \\ & = 32 - 1 + 2 \\ & = \end{aligned}$$

e. $(-4^6) + (-4^4) \times (-4^0)$

$$\begin{aligned} & (-4^6) + (-4^4) \\ & = -4096 + -256 \\ & = -4352 \end{aligned}$$

f. $\frac{(-12)^2 \times (-12)^4}{(-12)^4 \times (-12)^0} = \frac{(-12)^6}{(-12)^4}$

$$= (-12)^2 = 144$$

9. Rewrite using scientific notation.

a. 8026

$$8.026 \times 10^3$$

c. 0.000217

$$2.17 \times 10^{-4}$$

b. 15 000 000

$$1.5 \times 10^7$$

d. 0.0000004

$$4 \times 10^{-7}$$

10. Rewrite *without* scientific notation.

a. 8.3×10^2

$$830$$

c. 0.485×10^{-1}

$$0.0485$$

b. 6.62×10^5

$$662000$$

d. 2.08×10^{-3}

$$0.00208$$

