Curriculum Outcome

(N1) Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by: representing repeated multiplication using powers; using patterns to show that a power with an exponent of zero is equal to one; solving problems involving powers.

(N2) Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents.

Student Friendly:
Chapter 2 Test Review

Warm Up

1. Complete the chart

Power	Base	Exponent	Product	Standard
-5^3				
	(-6)	4		
			-3x3x3x3	

2. Use the laws of exponents to simplify :

(a) $\dfrac{(2a^4b)^3(2a^5b^3)^2}{2a^6b^8}$ (b) $(4x^3y^5)^4 \div (2xy^4)^5$

3. Simplify then evaluate:

(a) $\dfrac{(9^3x9^5)^4}{(9^4)^7}$ (b) $(3^2x3^3) + (2^4\ x2)^3$

4. Write in powers of ten form: 3 250 981

5. Write in standard form:
$(4x10^7) + (1x10^5) + (7x10^4) + (3x10^2) + (8x10^0)$

6. Simplify and evaluate:

$7^2 + 4^2x4 - 9^0 \times 3^5$

Warm Up

1. Complete the chart

Power	Base	Exponent	Product	Standard
-5^3	5	3	-5x5x5	-125
$(-6)^4$	(-6)	4	(-6)(-6)(-6)(-6)	1296
-3^4	3	4	-3x3x3x3	

2. Use the laws of exponents to simplify :

(a) $\dfrac{(2a^4b)^3(2a^5b^3)^2}{2a^6b^8}$

$\dfrac{2^3a^{12}b^3 \cdot 2^2a^{10}b^6}{2a^6b^8}$

$\dfrac{2^5a^{22}b^9}{2a^6b^8}$

$2^4a^{16}b$

$16a^{16}b$

(b) $(4x^3y^5)^4 \div (2xy^4)^5$

$\dfrac{4^4x^{12}y^{20}}{2^5x^5y^{20}}$

$\dfrac{256x^7y^0}{32}$

$8x^7$

3. Simplify then evaluate:

(a) $\dfrac{(9^3x9^5)^4}{(9^4)^7}$

$\dfrac{(9^8)^4}{9^{28}}$

$\dfrac{9^{32}}{9^{28}}$

9^4

6561

(b) $(3^2x3^3) + (2^4 x2)^3$

$3^5 + (2^5)^3$

$3^5 + 2^{15}$

$243 + 32768$

33011

4. Write in powers of ten form: 3 250 981

$(3\times10^6)+(2\times10^5)+(5\times10^4)+(9\times10^2)+(8\times10^1)+(1\times10^0)$

5. Write in standard form:

$(4\times10^7) + (1\times10^5) + (7\times10^4) + (3\times10^2) + (8\times10^0)$

$10^7\ 10^6\ 10^5\ 10^4\ 10^3\ 10^2\ 10^1\ 10^0$

4 0 1 7 0 3 0 8

6. Simplify and evaluate:

$7^2 + 4^2\times4 - 9^0 \times 3^5$

$7^2 + 4^3 - 1 \times 3^5$

$49 + 64 - 1 \times 243$

$49 + 64 - 243$

$113 - 243$

-130

Simplify

$$\frac{(3^2)^6 \times (4^6)^4 \times (3^4)^5 \times (4^2)^7}{(4^3)^5 \times (3^4)^3 \times (4^9)^2 \times (3^2)^6}$$

$$= \frac{(3^2)^6 \times (4^6)^4 \times (3^4)^5 \times (4^2)^7}{(4^3)^5 \times (3^4)^3 \times (4^9)^2 \times (3^2)^6}$$

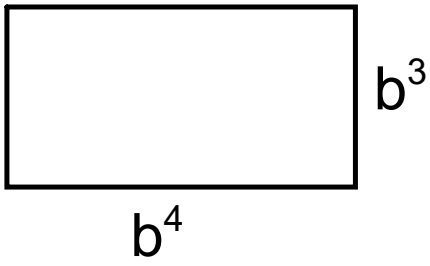
$$= \frac{(3^2)^6 \times (3^4)^5 \times (4^2)^7 \times (4^6)^4}{(3^2)^6 \times (3^4)^3 \times (4^9)^2 \times (4^3)^5}$$

$$= \frac{3^{12} \times 3^{20} \times 4^{14} \times 4^{24}}{3^{12} \times 3^{12} \times 4^{18} \times 4^{15}}$$

$$= \frac{3^{32} \times 4^{38}}{3^{24} \times 4^{33}}$$

$$= 3^8 \times 4^5$$

What is the Area and Perimeter of the following:



Area = base x height

Area = b^4 x b^3

Area = b^7

Perimeter = Side +Side +Side +Side

= b^3 + b^4 +b^3 + b^4

= $2b^3$ + $2b^4$

Exponent Laws

1) Zero Rule

-Anything raised to the exponent of zero is 1

$(-x)^0 = 1$ or $(x)^0 = 1$

2) Product of Powers Rule

When you multiply like bases you add the exponents

$$(a)^m \times (a)^n = (a)^{m+n}$$

3) Quotient Rule

When you divide like bases you Subtract the exponents

$$(a)^m \div (a)^n = (a)^{m-n}$$

4) Power to a Power Rule

With a power to a power we multiply exponents

$$(a^m)^n = (a)^{mxn}$$

5) Power of Product Rule

With a power of products we multiply exponents

$$[(a^m) \cdot (b^n)]^p = (a)^{mxp} \cdot (b)^{nxp}$$

6) Power of Quotient Rule

With a power of quotient we multiply exponents

$$\left[\frac{(a)^m}{(b)^n}\right]^p = \frac{(a)^{mxp}}{(b)^{nxp}}$$

7) Negative Exponent Rule

If you have a negative exponent move it to the denominator

$$x^{-a} = \frac{1}{x^a}$$