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:

"Exponent Law for a Quotient of Powers"

Grade 9 Warm Up

Get those brain muscles pumping!!!

Use BEDMAS to evaluate the following expressions:

$$\left[-(-2)^3-(-4)^3\right]^2-6^3\div(-2)^2+5(-3)^2\div 15$$

$$\left[+(+8)+(+64)\right]^2$$

$$\left[\,8+64\,\right]^2$$

$$[72]^2-6^3\div(-2)^2+5(-3)^2\div 15$$

$$5184-216\div(4)+5(9)\div 15$$

$$5184-54+45\div 15$$

$$5184-54+3$$

$$=5133$$

Section 2.4 Exponent Laws 1

Write each expression as a product and ~~then evaluate the following~~:

1) $3^2 \times 3^2$

$(3)(3)\ (3)(3)$

$= (3)^4$

$= 81$

2) $2^2 \times 2^5$

$(2)(2)\ (2)(2)(2)(2)(2)$

$(2)^7$

$= 128$

Do you notice anything???

3) $(-5)^2 \times (-5)^4$

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

Exponent Law for a Product of Powers


To multiply powers with the same base, add the exponents.

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

must be the same base


Write each of the following as a single power and then evaluate.

1) $7^2 \times 7^4$

$= (7)^6$

$= 117649$

2) $(-2)^5 \times (-2)^3$

$= (-2)^8$

$= 256$

3) $4^5 \times 4^1$

$= (4)^6$

$= 4096$

What happens when we divide powers with the same base?

1) $\frac{2^6}{2^2} = \frac{(2)(2)(2)(2)(2)(2)}{(2)(2)}$

$= 2^4$

Do you notice anything???

Exponent Law for a Quotient of Powers


To divide powers with the same base, subtract the exponents.

must be the same base

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


What happens when we divide powers with the same base?

2) $\frac{7^9}{7^4} = 7^5$

$= 16\,807$

3) $\frac{(-5)^7}{(-5)^3}$

$= (-5)^4$

$= 625$

Remember to always use BEDMAS when evaluating

Simplify first (using exponent law I) THEN Evaluate each of the following:

1) $3^{10} \div 3^6 + 3^2$

$\rightarrow 3^4 + 3^2$

$\rightarrow 81 + 9$

$= 90$

2) $-2^3(2^9 \div 2^7) - 2^1$

$-(2)^3(2^2) - 2^1$

$-2^5 - 2^1$

$-32 - 2$

$= -34$

3) $\dfrac{10^{1003}}{10^{1000}} - 1$

Laws

1) $x^0 = 1$

2) $(x)^a (x)^b = x^{a+b}$

3) $\dfrac{(x)^b}{(x)^a} = x^{b-a}$

MUST COPY OUT QUESTION AND THEN ANSWER

Page 76 & 77
Questions :
3,4acegh, 5bdfh,7,8,10bdfhj

Attachments

Exponent Law 1 Review.pdf