2.5 Exponent Laws II

Friday, November 20, 2015 12:29 PM

2.5 Blank Notes

2.5 – Exponent Laws II **Name**_____ _____
Math 9 **Blk**____
Notes

Warm up: Complete the table and see if you can find a pattern:

$2^2 \times 2^3 = 2^5$ $2^5 \div 2^4 = 2^1$

Power	Repeated Multiplication	Expanded Form	Power
$(2^3)^2$	$2^3 \times 2^3$	2x2x2 x 2x2x2	2^6
$(4^2)^4$	$4^2 \times 4^2 \times 4^2 \times 4^2$	4x4x4x4x4x4x4x4	4^8
$(5^3)^3$	$5^3 \times 5^3 \times 5^3$	5x5x5x5x5x5x5x5x5	5^9
$[(-3)^2]^5$	$(-3)^2 \times (-3)^2 \times (-3)^2 \times (-3)^2 \times (-3)^2$		$(-3)^{10}$

Is there a pattern /shortcut that you see? multiply the exponents.

What is the Exponent Law for a Power of a Power?

To raise a power to a power, multiply the exponents (keep the base the same)

Ex1 – Simplify as a power:

a) $(9^5)^6$

$= 9^{5 \times 6}$

$= 9^{30}$

b) $[(-1)^3]^4$

$(-1)^{3 \times 4}$

$= (-1)^{12}$

c) $-(3^7)^2$

$-(3^{7 \times 2})$

-3^{14}

How can you simplify $(3 \times 4)^5$? $= (3 \times 4) \times (3 \times 4) \times (3 \times 4) \times (3 \times 4) \times (3 \times 4)$

$= 3 \times 4 \times 3 \times 4 \times 3 \times 4 \times 3 \times 4 \times 3 \times 4$

$= 3 \times 3 \times 3 \times 3 \times 3 \times 4 \times 4 \times 4 \times 4 \times 4$

$= 3^5 \times 4^5$

What is the Exponent Law for a Power of a Product?

$(ab)^m = a^m b^m$

$(3 \times 4)^5 = 3^5 \times 4^5$

2.5 – Exponent Laws II **Name**_____ _____
Math 9 **Blk**____
Notes

Ex2 – Simplify as a power:

a) $(2 \times 3)^6$ $= 2^6 \times 3^6$

b) $[(-8) \times 4]^2$ $(-8)^2 \times 4^2$

c) $(2m)^3$ $2^3 m^3$

How can you simplify $\left(\frac{2}{3}\right)^3$? $= \left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right) = \frac{2\times2\times2}{3\times3\times3} = \frac{2^3}{3^3}$

$\left(\frac{4}{7}\right)^2 = \frac{4^2}{7^2}$

What is the Exponent Law for a Power of a Quotient?

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

Ex3 – Simplify as a power: a) $\left(\frac{5}{6}\right)^4 = \frac{5^4}{6^4}$

Ex4 – Simplify, then evaluate YOU TRY

a) $-(2 \times 3)^8 \div (3^3)^2$

$-2^8 \times 3^8 \div 3^6$

$-2^8 \times 3^2$

-256×9

$= -2304$

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

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

$= 3^{15} - 4^{10}$

$= 14348907 - 1048576$

$= 13300331$

Quiz on Tuesday
2.3 – 2.5

HW 2.5 worksheet

2.5 – Exponent Laws II
Math 9
Notes

Name_____ _____
Blk____

2.5 – Exponent Laws II
Math 9
Notes

Name_____ _____
Blk____