

Name: _____

Date: _____

Aim: What are the Laws of Exponents (Day 3)?

D O N O W :

Write each expression as a single power raised to a positive exponent.

1.) $b^3 \cdot b^5$
 b^8

2.) $n^{-1} \cdot n^{-4}$
 n^{-5}
 $\frac{1}{n^5}$

3.) $(-2)^2 \cdot (-2)^5$
 $(-2)^7$

4.) $\frac{x^5}{x^4}$
 x^1

5.) $\frac{n^5 n^6}{n^3}$
 $\frac{n^{11}}{n^3}$
 n^8

Evaluate the following using the order of operations.

6.) $(2^3)^2$
 $(8)^2$
 64

7.) $(n^5)^6$

Power of a Power

Complete the table below.

Power	Base	Expand	Product as a Power
7^2	7	$7 \cdot 7$	
x^2	x	$x \cdot x$	
w^2	w	$w \cdot w$	
$(w^8)^2$	w^8	$w^8 \cdot w^8$	w^{16}
$(y^3)^4$	y^3	$y^3 \cdot y^3 \cdot y^3 \cdot y^3$	y^{12}
$(x^2)^5$	x^2	$x^2 \cdot x^2 \cdot x^2 \cdot x^2 \cdot x^2$	x^{10}

Law 5: $(a^m)^n = a^{m \cdot n}$

Keep the base,
multiply the
exponent

Simplify each expression as a base to a single exponent.

1.) $(5^3)^9$
 5^{27}

2.) $(4^3)^2$
 4^6

3.) $(x^3)^2$
 x^6

4.) $(x^4 y^5)^2$
 $x^8 y^{10}$

5.) $(3x^3 y^2)^4$
 $3^4 x^{12} y^8$

More Practice

Write each expression as a base to a single exponent.

a) $(x^3)^2$

$$\boxed{x^6}$$

b) $(a^4)^8$

$$\boxed{a^{32}}$$

c) $(x^{-4})^2$

$$x^{-8}$$
$$\boxed{\frac{1}{x^8}}$$

d) $(2^2 \cdot 2^4)^3$

$$(2^6)^3$$
$$\boxed{2^{18}}$$

Simplify each expression as a base to a single positive exponent. Evaluate where possible.

e) $(a^3)^0$

$$a^0$$
$$\boxed{1}$$

f) $(19^3)^0$

$$19^0$$
$$\boxed{1}$$

g) $(x^{-4})^2$

$$x^{-8}$$
$$\boxed{\frac{1}{x^8}}$$

h) $(k^{-2})^0$

$$k^0$$
$$\boxed{1}$$

i) $(h^3)^{-3}$

$$h^{-9}$$
$$\boxed{\frac{1}{h^9}}$$

j) $(x^2)^8 \div (x^2)^4$

$$x^{16} \div x^8$$
$$\boxed{x^8}$$

k) $(p^4 \div p^6)^3$

$$(p^{-2})^3$$
$$p^{-6}$$
$$\boxed{\frac{1}{p^6}}$$

l) $(a^3 \cdot a^2 \cdot a^{-4})^2$

$$(a^1)^2$$
$$\boxed{a^2}$$

The
TAKEAWAY

Summary of the laws:

$$y^0 = \underline{1}$$

$$y^{-5} = \underline{\frac{1}{y^5}}$$

$$y^6 \cdot y^2 = \underline{y^8}$$

$$y^9 \div y^3 = \underline{y^6}$$

$$(y^6)^2 = \underline{y^{12}}$$