Welcome Back MYP Math 9!

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: 2 - 5 Topic: 2B: Indices (Zero and Negative Exponents)	0 1 2	
Tuesday Date: 2 - 6 Topic: Study Guide, Criterion C	0 1 2	
Wednesday Date: 2 - 6 Topic: Trashetball!	0 1 2	
Thursday Date: _____ Topic: _____	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Class Plan: Review Index Laws

1) Unit 5: Quiz Review handout
2) Finish study guide
(Due Friday, beginning of hour)

After school:

Wednesday - Garages!
Thursday after school! ***W124 :)***

B Chapter 2 INDEX LAWS

Product Property of Exponents

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

Quotient Property of Exponents

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

Definition of Negative Exponents

$$a^{-n} = \frac{1}{a^n} \quad \text{or} \quad \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^{n}$$

Zero Exponents

$$a^0 = 1$$

Power of a Power Property

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

Power of a Product Property

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

Power of a Quotient Property

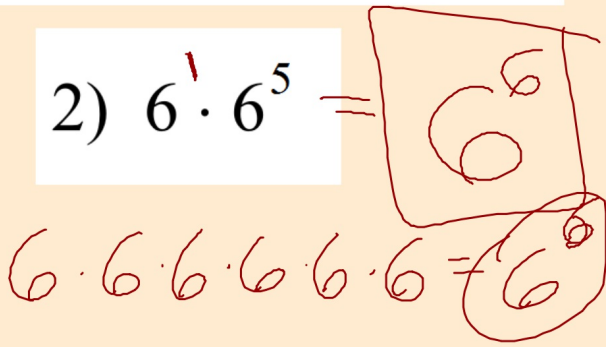
$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

***Important:
Recognize how connected the properties are.

Simplify. Your answer should contain only positive exponents.

1) $5^4 \cdot 5^6$

2) $6^1 \cdot 6^5 =$



Simplify. Your answer should contain only positive exponents.

3) $\left(2^4\right)^4$

4) $\left(3^{-4}\right)^{-3} = 3^{12}$

531,441

Simplify. Your answer should contain only positive exponents.

5) $\dfrac{3^3}{3}$

6) $\dfrac{4^2}{4^3} = 4^{-1} = \dfrac{1}{4}$

Simplify. Your answer should contain only positive exponents.

7) 2^{-4}

8) 3^{-1}

$\frac{1}{3^1} = \boxed{\frac{1}{3}}$

Simplify. Your answer should contain only positive exponents.

9) $\dfrac{4x^0y^3}{3y}$

Simplify. Your answer should contain only positive exponents.

10) $\dfrac{x^3 y^4}{2x^0 y^3}$

$= \dfrac{x^3 y^4}{2 y^3} = \boxed{\dfrac{x^3 y^1}{2}}$

Simplify. Your answer should contain only positive exponents.

11) $2^2 \cdot (2^4)^3$ $= 2^{14}$

$= 16{,}384$

Simplify. Your answer should contain only positive exponents.

12) $2 \cdot 2^{2} \cdot 2^{-1}$

Simplify. Your answer should contain only positive exponents.

13) $2^{-2} \cdot 2^{-2} \cdot \left(2^{4}\right)^{3}$

Simplify. Your answer should contain only positive exponents.

14) $2^3 \cdot \left(2^{-3}\right)^4$

Simplify. Your answer should contain only positive exponents.

15) $r^{-4} \cdot 4r^{6}$

Simplify. Your answer should contain only positive exponents.

16) $5x^{3} \cdot 3x^{-1}$

Simplify. Your answer should contain only positive exponents.

17) $3x^5 \cdot 2x^2$

18) $n^{-5} \cdot 4n^5$

Simplify. Your answer should contain only positive exponents.

19) $\left(y^6\right)^2 \cdot x^5 y^4$

Simplify. Your answer should contain only positive exponents.

20) $\left(x^5 y^4\right)^6 \cdot y^{-6}$

Simplify. Your answer should contain only positive exponents.

21) $\left(m^3 n^5\right)^0 \cdot m^6 n^5$

$= 1 \cdot m^6 \cdot n^5$

$= m^6 n^5$

Simplify. Your answer should contain only positive exponents.

22) $\left(x^{5} \cdot x^{-4} y^{-6}\right)^{-6}$

Simplify. Your answer should contain only positive exponents.

23) $ba^4 \cdot (a^3b^4)^3$

Simplify. Your answer should contain only positive exponents.

24) $\left(x^6\right)^0 \cdot \left(x^0\right)^2$

Simplify. Your answer should contain only positive exponents.

25) $\dfrac{6x^4y^2}{6x^3y^0}$

Simplify. Your answer should contain only positive exponents.

26) $\dfrac{m^6 n^4}{3m^5 n^3}$

Simplify. Your answer should contain only positive exponents.

27) $\dfrac{4x^{3} \cdot 4x^{-2}}{x^{0}}$

$= \dfrac{4x^{3} \cdot 4x^{-2}}{1}$

$= \boxed{16x}$

Simplify. Your answer should contain only positive exponents.

28) $\dfrac{4n^{-5}}{6n^{3} \cdot 3n^{5}}$

$= \dfrac{4n^{-5}}{18n^{8}} = \dfrac{2}{9n^{13}}$

$\dfrac{2n^{-13}}{9} = \dfrac{2}{9n^{13}}$

Solutions

Answers to Applying Properties of Exponents (ID: 1)

1) 5^{10}
2) 6^{6}
3) 2^{16}
4) 3^{12}
5) 3^{2}
6) $\frac{1}{4}$
7) $\frac{1}{2^{4}}$
8) $\frac{1}{3}$
9) $\frac{4y^{2}}{3}$
10) $\frac{x^{3}y}{2}$
11) 2^{14}
12) 2^{2}
13) 2^{8}
14) $\frac{1}{2^{9}}$
15) $4r^{2}$
16) $15x^{2}$
17) $6x^{7}$
18) 4
19) $y^{16}x^{5}$
20) $x^{30}y^{18}$
21) $m^{6}n^{5}$
22) $\frac{y^{36}}{x^{6}}$
23) $b^{13}a^{13}$
24) 1
25) xy^{2}
26) $\frac{mn}{3}$
27) $16x$
28) $\frac{2}{9n^{13}}$

DETAILED Solutions

Simplify. Your answer should contain only positive exponents.

1) $5^4 \cdot 5^6 = 5^{4+6} = \boxed{5^{10}}$

2) $6 \cdot 6^5 = 6^{1+5} = \boxed{6^6}$

3) $(2^4)^4 = 2^{4 \cdot 4} = \boxed{2^{16}}$

4) $(3^{-4})^{-3} = 3^{-4 \cdot -3} = \boxed{3^{12}}$

5) $\frac{3^3}{3} = 3^{3-1} = \boxed{3^2}$

6) $\frac{4^2}{4^3} = 4^{2-3} = 4^{-1} = \boxed{\frac{1}{4}}$

7) $2^{-4} = \frac{1}{2^4} = \boxed{\frac{1}{16}}$

8) $3^{-1} = \boxed{\frac{1}{3}}$

DETAILED Solutions

9) $\frac{4x^0y^3}{3y} = \frac{4}{3} \cdot 1 \cdot y^{3-1}$

$= \boxed{\frac{4y^2}{3}}$

10) $\frac{x^3y^4}{2x^0y^3} = \frac{1}{2} \cdot x^{3-0} \cdot y^{4-3}$

$\frac{1}{2} \cdot x^3 \cdot y^1$

$\boxed{\frac{x^3y}{2}}$

11) $2^2 \cdot (2^4)^3 = 2^2 \cdot 2^{12}$

$= 2^{2+12}$

$= \boxed{2^{14}}$

12) $2 \cdot 2^2 \cdot 2^{-1} = 2^{1+2+-1}$

$= \boxed{2^2}$

13) $2^{-2} \cdot 2^{-2} \cdot (2^4)^3 = 2^{-2+-2+12}$

2^{12}

$= \boxed{2^8}$

14) $2^3 \cdot (2^{-3})^4 = 2^3 \cdot 2^{+12}$

2^{-12}

$= \boxed{2^{-9}} = \boxed{\frac{1}{2^9}}$

DETAILED Solutions

15) $r^{-4} \cdot 4r^6$ $= 4 \cdot r^{-4+6}$

$= \boxed{4r^2}$

16) $5x^3 \cdot 3x^{-1}$ $= 5 \cdot 3 \cdot x^{3+-1}$

$= \boxed{15x^2}$

17) $3x^5 \cdot 2x^2$ $3 \cdot 2 \cdot x^{5+2}$

$= \boxed{6x^7}$

18) $n^{-5} \cdot 4n^5$ $= 4 \cdot n^{-5+5}$

$= 4 \cdot n^0$

$= 4 \cdot 1$

$= \boxed{4}$

19) $(y^6)^2 \cdot x^5 y^4$ $= x^5 y^{4+12}$

y^{12}

$= \boxed{x^5 y^{16}}$

20) $(x^5 y^4)^6 \cdot y^{-6}$

$= x^{30} y^{24+-6}$

$= \boxed{x^{30} y^{18}}$

21) $(m^3 n^5)^0 \cdot m^6 n^5$

$= 1 \cdot m^6 \cdot n^5$

$= \boxed{m^6 n^5}$

22) $(x^5 \cdot x^{-4} y^{-6})^{-6}$

$x^{-30} x^{24} y^{36}$

$x^{-6} y^{36}$ $= \boxed{\dfrac{y^{36}}{x^6}}$

$\dfrac{1}{x^6} \cdot y^{36}$

DETAILED Solutions

23) $ba^4 \cdot (a^3b^4)^3$

$= b^1 \cdot a^4 \cdot a^9 \cdot b^{12}$

$= a^{4+9} b^{1+12}$

$= \boxed{a^{13} b^{13}}$

24) $(x^6)^0 \cdot (x^0)^2$

$x^0 \cdot x^0$

$\boxed{1}$

25) $\dfrac{6x^4y^2}{6x^3y^0}$

$x^{4-3} y^{2-0}$

$\boxed{xy^2}$

26) $\dfrac{m^6n^4}{3m^5n^3} = \dfrac{1}{3} \cdot m^{6-5} n^{4-3}$

$\dfrac{1}{3} \cdot m \cdot n$

$\boxed{\dfrac{mn}{3}}$

27) $\dfrac{4x^3 \cdot 4x^{-2}}{x^0} = \dfrac{4 \cdot 4 \cdot x^{3+-2}}{1}$

$\boxed{16x}$

28) $\dfrac{4n^{-5}}{6n^3 \cdot 3n^5}$

$\dfrac{4}{6} \cdot n^{-5-3} \cdot \dfrac{1}{3} \cdot \dfrac{1}{n^5} = \dfrac{4}{18} \cdot n^{-8} \cdot n^{-5}$

$\dfrac{4}{18} \cdot n^{-13} = \dfrac{2}{9} \cdot n^{13} = \boxed{\dfrac{2}{9n^{13}}}$