

January 5th

Due Today: 6.0 Winterbreak Packet

Unit 6: Exponents and Radicals

Lesson 6.1: Review of Basic Exponent Laws

**Please get out your winter break packet!**

**BASIC EXPONENT LAWS:**

MULTIPLICATION:  $x^a \cdot x^b = x^{a+b}$

DIVISION:  $\frac{x^a}{x^b} = x^{a-b}$

NEGATIVE:  $x^{-a} = \frac{1}{x^a}$ ,  $\frac{1}{x^{-a}} = x^a$

POWER OF A POWER:  $(x^a)^b = x^{ab}$

ZERO:  $x^0, a^0, 100^0 = 1$

$$\frac{x^6}{x^4} = \frac{x^2}{1}$$

$$\frac{4x^4}{5x^6} = \frac{4}{5x^2}$$

$$\frac{6x^6}{4x^4}$$

$$\frac{6}{4} \cdot \frac{x^6}{x^4}$$

↓                      ↓

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

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

**Tip for an order:****Zippy****Please****Make****Delicious****Noodles!**

\* simplify Num + Den.  
Separately first, then divide

**Other Tips:**

Your answer should only have  
ONE of each letter:

All Fractions should be  
reduced!

$$\frac{10x^2}{5x}$$

$\swarrow$        $\searrow$   
 2       $x^2$   
 $\swarrow$        $\searrow$   
 $2x$

## Winter Break Packet Solutions

Simplify the following mixed exponents problems. Your answer should contain only positive exponents.

47)  $x^{-4} \cdot 4x^2$

$\frac{4}{x^2}$

48)  $\frac{x}{x^0}$

$x$

49)  $4x^2y^4 \cdot x^3y^{-2}$

$4x^5y^2$

50)  $\frac{2a^3b^{-1}}{a^{-2}b^2}$

$\frac{2a^5b^3}{b^3} = \frac{2a^5}{b^3}$

$3 + 1 - 2 = a^5$   
 $-1 - 2 = b^{-3}$

51)  $(2n^3)^{-2}$

$\frac{1}{4n^6}$

$\frac{3^{-3}}{3^3} = \frac{1}{27}$

52)  $2m^0 \cdot 2m^{-4}n^2$

$\frac{4n^2}{m^4}$

$4m^4n^2$

53)  $(y^3)^2$

$y^6$

54)  $2p^{-1} \cdot 3p^0$

$\frac{6}{p}$

55)  $\frac{2uv^4}{2v^{-1}}$

$v^5u$

$uv^5$

$4 - 1 = v^5$

56)  $(3x^4y)^3$

$27x^{12}$

$3^3 x^{12}$

$27x^{12}$

Simplify these multistep problems. Your answer should contain only positive exponents.

57)  $k \cdot (k^5)^3$

$k^{16}$

$k^1 \cdot k^{15} = k^{16}$

58)  $(p^3)^3 \cdot 2p$

$2p^{10}$

59)  $\frac{2n^4}{2n^2 \cdot 2n^2}$

$\frac{1}{2}$

$\frac{2n^4}{4n^4}$

60)  $\frac{4x^3 \cdot 4x^3}{5x^5}$

$\frac{16x}{5}$

$\frac{16x^6}{5}$

**Practice:**

1)  $4x^3y^4 \cdot 3x^3y^3$

2)  $(3x^2y^2)^3$

3)  $\frac{4y^2}{2xy^6}$

4)  $4m^{-2}n^4 \cdot 2m^{-4}n^{-2}$

5)  $\frac{2x^{-3} \cdot 2x^4y^{-2}}{x^{-4}}$

6)  $(x^2y^{-4})^{-1} \cdot x^2$

## Practice Solutions:

$$1) 4x^3y^4 \cdot 3x^3y^3$$

$$12x^6y^7$$

$$2) (3x^2y^2)^3$$

$$3^3 \cdot (x^2)^3 (y^2)^3$$

$$27x^6y^6$$

$$3) \frac{4y^2}{2xy^6}$$

$$\frac{2}{xy^4}$$

$$\frac{2}{xy^4}$$

$$2-6 = -4$$

$$y^{-4} = \frac{1}{y^4}$$

~~$$\frac{4y^2}{2xy^6}$$~~

$$4) 4m^{-2}n^4 \cdot 2m^{-4}n^{-2}$$

$$\frac{8m^2}{m^6} n^2$$

$$-2+4 = -6$$

$$4+(-2) = -2$$

$$\frac{8n^2}{m^6}$$

$$5) \frac{2x^{-3} \cdot 2x^4y^{-2}}{x^{-4}}$$

$$\frac{4x^5}{y^2}$$

$$-3+4 = 1$$

$$\frac{4x^1y^{-2}}{x^{-4}}$$

$$1+4 = x^5$$

$$4x^5y^{-2}$$

$$\frac{4x^5}{y^2}$$

$$6) (x^2y^{-4})^{-1} \cdot x^2$$

$$y^4$$

$$x^{-2}y^4 \cdot x^2$$

$$x^0y^4$$

$$y^4$$

**Exponent Mini Quiz**



## Unit 6: Exponents and Radicals

Lesson #	Name	Recap	HW
6.1	Review of basic Exponent Laws		HW 6.1 *unit 5 corrections