## 10-23-17

Aim: SWBAT identify exponents, powers, and bases AND evaluate expressions with exponents.

HW: Packet Pg. 5

Do Now: Write your name on the Unit 3 Packet

AIM: SWBAT identify exponents, powers and bases, and evaluate expressions using exponents.

Quick Review of Exponents

Base The factor used in repeated multiplication

The exponent is \_

25 expressed in standard form is \_

The powers  $5^2$ ,  $9^3$ , and  $8^4$  are read as follows.

52 five to the second power or five squared

93 nine to the third power or nine cubed

84 eight to the fourth power

## Examples:

Write each of the following as a product of the same factor.

 $b^3 = \frac{b \cdot b \cdot b}{(-1.5)^4}$ 

$$6 \cdot 6 = 6^2$$

Solve each equation. Express your answer in standard form.

$$x = 4^2$$

2) 
$$z = 7^3$$

$$y = (-3)(-3)(-3)(-3)$$

4) 
$$z = \left(\frac{2}{3}\right)^3$$

$$Z = \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3}$$

$$Z = \frac{8}{3}$$

\* 5) 
$$x = (-5)^2$$

$$\chi = (-5)(-5)$$

$$\chi = 25$$

If n is a positive even number, will (-55)<sup>n</sup> be positive or negative? Positive

If n is a positive odd number, will (-3.5)<sup>n</sup> be positive or negative?

Negative



\*\*Any number to the zero power (except 0) is one.

Examples: 9° = \_\_\_\_\_\_ 1.2° = \_\_\_\_\_ (-110)° = \_\_\_\_\_ 0° = \_\_\_\_\_ 6° red



\*\*\*Any number to the first power is equal to itself.

Examples:  $9^1 = 9$  6.23<sup>1</sup>= 6.23  $\left(\frac{3}{5}\right)^1 = \frac{3}{5}$ 

$$\left(\frac{3}{5}\right)^1 = \frac{3}{5}$$

Classwork.

Write each product using exponents:

$$\chi^2 y^5$$

4) 
$$\frac{11}{5} \cdot \frac{11}{5} \cdot \frac{11}{5}$$

Write each power as a product of the same factor:

Evaluate each expression. When you replace a variable that has an exponent put it in parenthesis.

 $n^2$  if n = 5

7) 
$$8x^3$$
 if  $x = -3$ 

9) 
$$4x^2$$
 if  $x = \frac{1}{2}$ 

 $(5)^2$ 

30000

2

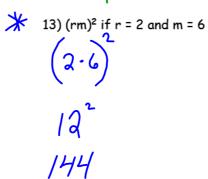
Evaluate each expression:

10) 
$$x^4$$
 if  $x = -\frac{2}{5}$ 

$$\left(-\frac{2}{5}\right)^4$$

$$\frac{16}{5}$$

12) 
$$3m^2y^3$$
 if  $m = 5$  and  $y = 3$   
 $3 \cdot m^2 \cdot y^3$   
 $3 \cdot (5)^2 \cdot (3)^3$   
 $3 \cdot 25 \cdot 27$   
 $2025$ 



14) Rewrite 8 as a power of 2  $\frac{3}{2}$ 

15) Rewrite 9 as a power of 3  $3^2$ 

16) Rewrite 81 as a power of 3

HW: Using Exponents

Write each product using exponents:

Express each of the following as a standard numeral:

8) 
$$\left(\frac{1}{5}\right)^3$$
 9) 125°

Determine whether each sentence is true or false.

10) 
$$2^{10} > 10^2$$

11) 
$$9^8 > 8^9$$

11) 
$$9^8 > 8^9$$
 12)  $2^4 = 4^2$  13)  $2^3 \neq 3^2$ 

13) 
$$2^3 \neq 3^3$$

Evaluate each expression:

14) 
$$x^3$$
 if  $x = -6$ 

14) 
$$x^3$$
 if  $x = -6$  15)  $4r^3$  if  $r = 3$  16)  $(xy)^3$  if  $x = \frac{1}{5}$  and  $y = 10$ 

- 17) Write an expression with (-1) as its base that will produce a positive product.
- 18) Write an expression with (-1) as its base that will produce a negative product.
- 19) Tim wrote 16 as (-2)4. Is he correct? Explain why or why not.

Rewrite each of the following numbers in exponential notation using a base of 2.

20) 8

21) 32

22) 128