

Name: _____ Hour: _____ Date: _____

NOTES: Section 8.2 – Zero and Negative Exponents

Goals: #1 - I can apply exponent properties involving quotients.



#2 - I can evaluate powers that have zero or negative exponents.

Homework: Section 8.2 Worksheet

Warm Up:

Simplify the expression. Write your answer using exponents.

1. $7^3 \cdot 7^6$

2. $(y^4)^3$

Simplify the expression.

1. $(2y)^4$

2. $(3b^3)^2 \cdot b$

Exploration #1: Work with a partner and answer the following questions.

1. Evaluate the following exponents:

a. $10^1 =$

b. $10^2 =$

c. $10^3 =$

d. $10^0 =$

2. Use your calculator to evaluate the following exponents and write your answer as FRACTIONS :

a. $10^{-1} =$

b. $10^{-2} =$

c. $10^{-3} =$

d. Can you write your answer in letters a – c using EXPONENTS?

3. What do you notice?

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Notes:

_____ to the power of _____ is _____.

Example:

When numbers have a _____ exponent, it is also their _____.

Example:

Example #1: Evaluate the expression.

1. 7^{-2}

2. $(-6)^0$

3. $(-5)^{-3}$

4. $(\frac{2}{3})^{-2}$

You practice: Evaluate the expression.

1. $(-7)^{-1}$

2. $(\frac{1}{5})^{-3}$

3. $(5)^{-3}$

4. $(-100)^0$

Example #2: Simplify the expression. Write your answer using only positive exponents.

1. $2x^2y^{-3}$

2. $(5a)^{-2}$

3. $\frac{c^{-2}}{d^{-3}}$

You practice: Simplify the expression. Write your answer using only positive exponents.

1. $(5b)^{-3}$

2. $2x^{-3}y^3$

3. $\frac{3}{x^{-2}}$

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Exploration #2: Work with a partner and answer the following questions.

1. How can you write 7^5 as products?
2. How can you write 7^3 as products?
3. How can you divide $\frac{7^5}{7^3}$? What about $\frac{x^{10}}{x^4}$? Can you write your answer using exponents?
4. Complete: $\frac{a^m}{a^n} = a^{\boxed{}}$

Notes:

To _____ powers that have the _____ base, we _____ the exponents.

Example:

Example #3: Simplify the expression.

1. $\frac{x^9}{x^2}$

2. $\frac{(-4)^7}{(-4)^5}$

3. $\frac{p^8 \cdot p^{10}}{p^{18}}$

You practice: Simplify the expression.

2. $\frac{3^{10}}{3^7}$

2. $\frac{y^{100}}{y^{99}}$

3. $\frac{m^7}{m^2 \cdot m}$