

You will need a spiral or composition notebook and a pencil daily for class.

Tear out pages 293 - 328 and put in your 3-ring binder
(if you have it)

Tabs for binder:

1. Forms
2. Textbook pages
3. Worksheets
4. Assessments

Oct 7-11:45 AM

Exponents and Scientific Notation



LESSON

10.1 Integer Exponents



Know and apply the properties of integer exponents to generate equivalent numerical expressions.

Oct 7-11:51 AM

Fill in the table on page 297 Using Patterns of Integer Exponents

The table below shows powers of 5, 4, and 3.

$5^4 = 625$	$5^3 = 125$	$5^2 = 25$	$5^1 = 5$	$5^0 = 1$	$5^{-1} = \frac{1}{5}$	$5^{-2} = \frac{1}{25}$
$4^4 = 256$	$4^3 = 64$	$4^2 = 16$	$4^1 = 4$	$4^0 = 1$	$4^{-1} = \frac{1}{4}$	$4^{-2} = \frac{1}{16}$
$3^4 = 81$	$3^3 = 27$	$3^2 = 9$	$3^1 = 3$	$3^0 = 1$	$3^{-1} = \frac{1}{3}$	$3^{-2} = \frac{1}{9}$

- A** What pattern do you see in the powers of 5?
As the exponent decreases by 1, the value of the power is divided by 5.

- B** What pattern do you see in the powers of 4?
As the exponent decreases by 1, the value of the power is divided by 4.

- C** What pattern do you see in the powers of 3?
As the exponent decreases by 1, the value of the power is divided by 3.

Oct 7-11:53 AM

Reflect

- Make a Conjecture** Write a general rule for the value of a^0 .
- Make a Conjecture** Write a general rule for the value of a^{-n} .

$$\frac{a^0 = 1}{a^{-n} = \frac{1}{a^n}}$$

$5^4 = 625$	$5^3 = 125$	$5^2 = 25$	$5^1 = 5$	$5^0 = 1$	$5^{-1} = \frac{1}{5}$	$5^{-2} = \frac{1}{25}$
$4^4 = 256$	$4^3 = 64$	$4^2 = 16$	$4^1 = 4$	$4^0 = 1$	$4^{-1} = \frac{1}{4}$	$4^{-2} = \frac{1}{16}$
$3^4 = 81$	$3^3 = 27$	$3^2 = 9$	$3^1 = 3$	$3^0 = 1$	$3^{-1} = \frac{1}{3}$	$3^{-2} = \frac{1}{9}$



Oct 7-11:55 AM

EXPONENT RULES	
Property	Example
$x^0 = 1$	$2357^0 = 1$
$(x^a)(x^b) = x^{(a+b)}$	$(2^3)(2^5) = 2^8$

$$\left[x^{\frac{5+2}{1}} - \frac{x^2}{1+x} \right]^0 = 1$$

$$(2^3)(2^5) = 2^{3+5} = 2^8$$

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

Oct 7-11:57 AM

EXPONENT RULES	
Property	Example
$(x^a)^b = x^{(a \cdot b)}$	$(2^3)^5 = 2^{15}$

$$(2^3)^5 = 2^{3 \cdot 5} = 2^{15}$$

$$(5^2)^3 = 5^{2 \cdot 3} = 5^6$$

$$\left(\begin{matrix} 5^2 \\ 5 \cdot 5 \end{matrix} \right) \left(\begin{matrix} 5^2 \\ 5 \cdot 5 \end{matrix} \right) \left(\begin{matrix} 5^2 \\ 5 \cdot 5 \end{matrix} \right)$$

$$5^6$$

Oct 7-11:57 AM

EXPONENT RULES

Property	Example
----------	---------

$\frac{x^a}{x^b} = x^{(a-b)}$	$\frac{2^5}{2^3} = 2^2$
	$\frac{2^3}{2^5} = 2^{-2}$

$\frac{2^3}{2^5} = 2^{3-5} = 2^{-2}$
 $5 - 2 = 3$

$$\frac{2^5}{2^3} = 2^{5-3} = 2^2$$

$$\frac{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2}} = 2^2$$

Oct 7-11:57 AM

EXPONENT RULES

Property	Example
----------	---------

$\frac{1}{x^a} = x^{(-a)}$	$\frac{1}{2^3} = 2^{-3}$
	$\frac{1}{2^{-3}} = 2^3$

$\frac{1}{2^3} = 2^{-3}$
 $\frac{1}{2^{-3}} = 2^3$

$x^{(-a)} = \frac{1}{x^a}$

Oct 7-11:57 AM

Find the value of each power. (Explore Activity 1) pg. 300

1. $8^{-1} = \frac{1}{8^1} = \frac{1}{8}$

2. $6^{-2} = \frac{1}{6^2} = \frac{1}{36}$

3. $256^0 = \frac{1}{1}$

4. $10^2 = 100$

5. $5^4 = 625$

6. $2^{-5} = \frac{1}{2^5} = \frac{1}{32}$

Oct 7-12:03 PM

Homework - Worksheet

Oct 7-12:16 PM