

# ZERO & NEGATIVE EXPONENTS

SIMPLIFY THE EXPRESSIONS BELOW. WRITE YOUR ANSWERS USING POSITIVE EXPONENTS.

EXAMPLE 1:

$$(6xy^{-6})^3$$

EXAMPLE 2:

$$(4x^{-2}y^3)^5$$

## ZERO EXPONENTS

Algebra	Example
$b^0 = 1$	$4^0 = 1$

## NEGATIVE EXPONENTS

Algebra	Example
$b^{-n} = \frac{1}{b^n}$	$4^{-3} = \frac{1}{4^3} = \frac{1}{64}$

## DEFINITION OF ZERO & NEGATIVE EXPONENTS

$2^4$	$2 \cdot 2 \cdot 2 \cdot 2$	16
$2^3$		
$2^2$		
$2^1$		
$2^0$		
$2^{-1}$		
$2^{-2}$		
$2^{-3}$		
$2^{-4}$		

EXAMPLE 3:

$$\frac{9x^{-2}y^4}{18xy^6}$$

EXAMPLE 4:

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

USE PROPERTIES OF EXPONENTS

EVALUATE THE FOLLOWING EXPONENTIAL EXPRESSIONS.

EXAMPLE 1:

$$5^{-2}$$

EXAMPLE 2:

$$(-11)^0$$

EXAMPLE 3:

$$(-3)^{-4}$$

EXAMPLE 4:

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

EXAMPLE 5:

$$6^{-7} \cdot 6^7$$

EXAMPLE 6:

$$(2^{-2})^4$$

EXAMPLE 7:

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

EVALUATE EXPRESSIONS

# Answer Key!

## ZERO & NEGATIVE EXPONENTS

SIMPLIFY THE EXPRESSIONS BELOW. WRITE YOUR ANSWERS USING POSITIVE EXPONENTS.

EXAMPLE 1:

$$(6xy^{-6})^3 = 6^3 \cdot x^3 \cdot y^{-18}$$

$$= 216x^3y^{-18}$$

EXAMPLE 2:

$$(4x^{-2}y^3)^5 = 4^5 \cdot x^{-10} \cdot y^{15}$$

$$= 1024x^{-10}y^{15}$$

$$= \frac{1024y^{15}}{x^{10}}$$

### ZERO EXPONENTS

Algebra	Example
$b^0 = 1$	$4^0 = 1$

\*Anything raised to the zero power is one!

### NEGATIVE EXPONENTS

Algebra	Example
$b^{-n} = \frac{1}{b^n}$	$4^{-3} = \frac{1}{4^3} = \frac{1}{64}$

### DEFINITION OF ZERO & NEGATIVE EXPONENTS

$2^4$	$2 \cdot 2 \cdot 2 \cdot 2$	16
$2^3$	$2 \cdot 2 \cdot 2$	8
$2^2$	$2 \cdot 2$	4
$2^1$	2	2
$2^0$	Definition of zero exponent	1
$2^{-1}$	$\frac{1}{2}$	$\frac{1}{2}$
$2^{-2}$	$\frac{1}{2 \cdot 2}$	$\frac{1}{4}$
$2^{-3}$	$\frac{1}{2 \cdot 2 \cdot 2}$	$\frac{1}{8}$
$2^{-4}$	$\frac{1}{2 \cdot 2 \cdot 2 \cdot 2}$	$\frac{1}{16}$



## EVALUATE THE FOLLOWING EXPONENTIAL EXPRESSIONS.

EXAMPLE 1:

$$5^{-2} = \frac{1}{5^2} = \frac{1}{25}$$

EXAMPLE 2:

$$(-11)^0 = 1$$

EXAMPLE 3:

$$(-3)^{-4} = \frac{1}{(-3)^4} = \frac{1}{81}$$

EXAMPLE 4:

$$\frac{1}{2^{-3}} = 2^3 = 8$$

EXAMPLE 3:

$$\frac{9x^{-2}y^4}{18xy^6} = \frac{9y^4}{18x^2x^1y^6} = \frac{1}{2x^3y^2}$$

EXAMPLE 4:

$$\frac{(2x)^{-2}y^5}{-4x^2y^2} = \frac{2^{-2}x^{-2}y^5}{-4x^2y^2} = \frac{y^5}{-4(2^2)x^2x^2y^2} = -\frac{y^3}{16x^4}$$

EXAMPLE 5:

$$6^{-7} \cdot 6^7 = 6^0 = 1$$

EXAMPLE 6:

$$(2^{-2})^4 = 2^{-8} = \frac{1}{2^8} = \frac{1}{256}$$

EXAMPLE 7:

$$\frac{5^{-2}}{5^2} = \frac{1}{5^2 \cdot 5^2} = \frac{1}{5^4} = \frac{1}{625}$$

## USE PROPERTIES OF EXPONENTS

## EVALUATE EXPRESSIONS

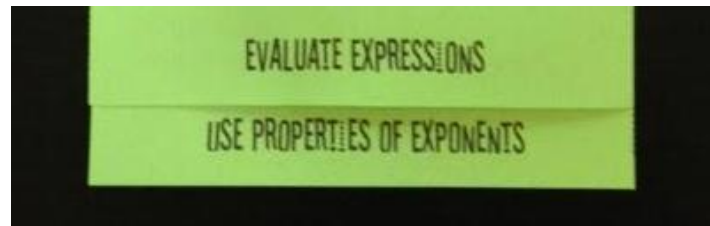
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Directions:

Step 1: Print pages 1 & 2 front to back so that the information is facing in opposite directions (I use the option to flip along the long edge, when printing). If you hold one side so that the writing is facing up, the writing on the back side should be facing down.

Step 2: Cut the page in half (along the dotted line)

Step 3: Line up the two pieces as shown below.



Step 4: Fold over the top portion and secure with staples.

The final product should look like this:

