

# Zero and Negative Exponent Guide Notes

## REVIEW: Properties of Power

PROPERTIES	EXAMPLE
$i. a^n \cdot a^m = a^{m+n}$	
$ii. \frac{a^m}{a^n} = a^{m-n}, a \neq 0 \text{ and } m > n$	
$iii. (a^m)^n = a^{mn}$	
$iv. (ab)^n = a^n b^n$	
$v. \left[\frac{a}{b}\right]^n = \frac{a^n}{b^n}$	

## Definition for Negative and Zero Exponent

$$a^0 = 1, a \neq 0$$

$$a^{-n} = \frac{1}{a^n} \text{ for any integer, } a \neq 0$$

**Sample Problem 1:** simplify the following expression.

1.  $-4^0 - 2^2 =$

2.  $-2x^0 =$

3.  $-2^{-4} - \frac{1}{2x^0} =$

4.  $(-x^0 - 1^{-1})^{-1} =$

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**Sample Problem 2:** Evaluate the following using properties of powers.

$$1. \left(\frac{-5}{4}\right)^{-3} =$$

$$2. \left(\frac{2x}{3y^4}\right)^{-2} =$$

$$3. \left[\frac{-(2x)^0}{2x^0}\right]^{-3} =$$

$$4. (-2x^{-2})^{-3} =$$

**Sample 3:** Simplify the following without negative exponent.

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

$$2. -2^{-1} - (-2^2)^0 =$$

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3.  $(x^{-1} - y^{-1})(x - y)^{-1} =$

4.  $\frac{(-4^{-1} - 2^{-1})^{-1}}{6^{-1} - 2^{-1}} =$