

Algebra I

Notes Section 7.3

Define and Use Zero Negative Exponents

Big Ideas

1. How to use the Zero Property of Exponents.
2. How to use the Negative Property of Exponents.

PROPERTIES

I. Zero Exponents _____

II. Negative Exponents _____

III. $a^m \cdot a^n$ _____

VI. $\frac{a^m}{a^n}$ _____

IV. $(a^m)^n$ _____

VII. $\frac{a}{b}^b$ _____

V. $(ab)^m$ _____

EXAMPLE 1 Simplify.

a) 3^{-2} _____

b) $(-7)^0$ _____

c) -7^0 _____

d) 1^{-2}
5 _____

e) 0^{-5} _____

EXAMPLE 2 Simplify.

a) $6^{-4} \cdot 6^4$

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

c) $\frac{1}{3^{-4}}$

d) $\frac{5^{-1}}{5^2}$

e) $(5^{-3})^{-1}$

f) $(-3)^5 \cdot (-3)^{-5}$

g) $\frac{6^{-2}}{6^2}$

EXAMPLE 3 Simplify.

a) $(2xy^{-5})^3$

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

c) $\frac{3xy^{-3}}{9x^3y}$

EXAMPLE 4

The order of magnitude of the mass of a polyphemus moth larva when it hatches is 10^{-3} gram. During the first 56 days of its life, the moth larva can eat about 10^5 times its own mass in food. **About how many grams of food can the moth larva eat during its first 56 days?**