

L7 Negative Exponents

Warm up: Evaluate using the calculator

$2^2 =$

$-2^2 =$

$(-2)^2 =$

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

$2^{-2} =$

$-2^{-2} =$

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

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

1

L7 Negative Exponents

$x^3 = x \cdot x \cdot x$

$x^2 = x \cdot x$

$x^1 = x$

$x^0 = 1$

$x^{-1} = 1 \div x = \frac{1}{x^1}$

$x^{-2} = 1 \div x \div x = \frac{1}{x \cdot x} = \frac{1}{x^2}$

$x^{-3} = 1 \div x \div x \div x = \frac{1}{x \cdot x \cdot x} = \frac{1}{x^3}$

$x^{-n} = \frac{1}{x^n}$

2

Another way to see what a negative exponent means...

$4^3 \div 4^5$

$= \frac{4 \times 4 \times 4}{4 \times 4 \times 4 \times 4 \times 4}$

$= \frac{1}{4^2}$

$4^3 \div 4^5$

$= 4^{3-5}$

$= 4^{-2}$

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

What I call
FLIP AND SWITCH
FLIP the base, and
SWITCH the
exponent to positive

A base raised to a **NEGATIVE** exponent is equivalent to 1 over the original base with the same **exponent** but **positive**.

3

EX 1: Write with a positive exponent

a) $3^{-2} =$

d) $p^{-3} =$

b) $2^{-2} =$

e) $\frac{a^3}{a^7} =$

c) $(10^2)^{-2} =$

f) $\frac{b^5}{b^{10}} =$

4

More examples

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

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

0.01

More examples

$(0.01)^2 (0.1)^{-1}$

$(a^2 b^{-1})(a^{-2} b^3)$

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

$(\frac{4b^{-1}}{a^8})^{-2}$

6

Practice:
1.6 # 1 – 4



7