

Notes 4-5

Int 2

Negative Exponents

Unit 4

Complete the table. *Neg Exp are like crying babies, they are unhappy and need to be moved.*

	Expanded	Exponent	Evaluated
$2^{-4} =$	$\frac{1}{2 \cdot 2 \cdot 2 \cdot 2}$	$\frac{1}{2^4}$	$\frac{1}{16}$
$2^{-3} =$	$\frac{1}{2 \cdot 2 \cdot 2}$	$\frac{1}{2^3}$	$\frac{1}{8}$
$2^{-2} =$	$\frac{1}{2 \cdot 2}$	$\frac{1}{2^2}$	$\frac{1}{4}$
$2^{-1} =$	$\frac{1}{2}$	$\frac{1}{2^1}$	$\frac{1}{2}$
$2^0 =$	1		1
$2^1 =$	1 \cdot 2	2^1	2
$2^2 =$	1 \cdot 2 \cdot 2	2^2	4
$2^3 =$	1 \cdot 2 \cdot 2 \cdot 2	2^3	8
$2^4 =$	1 \cdot 2 \cdot 2 \cdot 2 \cdot 2	2^4	16
$2^5 =$	1 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2	2^5	32

Handwritten notes in the table:
 - Blue notes on the left margin: $\frac{2^{-4}}{1}$, $\frac{2^{-3}}{1}$
 - Red arrows and notes on the right margin: $\cdot \frac{1}{2}$, $\div 2 \cdot \frac{1}{2}$, $\div 2$, $\div 2$, $\div 2$, $\div 2$, $\div 2$, $\div 2$

Anything raised to the 0 power is 1.

Ex. 1: $3^0 = 1$

Ex. 2: $7.5^0 = 1$

Ex. 3: $a^0 = 1$

Write each expression using a positive exponent.

Ex. 4: $\frac{6^{-3}}{1} = \frac{1}{6^3} = \frac{1}{216}$ ① Make it a fraction.

Ex. 5: $\frac{a^{-5}}{1} = \frac{1}{a^5}$

Ex. 6: $\frac{1}{x^{-4}} = x^4$

Ex. 7: $\frac{1}{7^{-2}} = 7^2 = 49$

Does a negative exponent make the answer negative?

No

Write each fraction as an expression using a negative exponent other than -1 .

Ex. 8: $\frac{1}{8^3} = 8^{-3}$

Ex. 9: $\frac{1}{4^1} = \frac{1}{2^2} = 2^{-2}$

Ex. 10: $\frac{1}{27} = \frac{1}{3^3} = 3^{-3}$

What does it mean to simplify:

No answers can have neg exp.

Simplify.

Ex. 11: $\frac{5^3 \cdot 5^{-5}}{1} = \frac{5^3}{5^5} = \frac{1}{5^2}$

~~5~~ ~~5~~ ~~5~~ ~~5~~ ~~5~~ ① Make the problem one big fraction.

② Make all neg exp happy

③ Simplify

Ex. 12: $\frac{w^{-1}}{w^{-4}} = \frac{w^4}{w^1} = w^3$

Ex. 14: $\frac{x^3}{x^{-5}} = \frac{x^3 x^5}{1} = x^8$

Ex. 15: $\frac{\cancel{h^0} \cdot h^{-3} \cdot h^5}{1} = \frac{h^5}{h^3} = h^2$

Order the following from least to greatest.

Ex. 16: $4^3, 4^0, -4, 4^{-2} = \frac{1}{4^2}$ $-4, 4^{-2}, 4^0, 4^3$

$64, 1, -4, \frac{1}{16}$