Name _____

INTEGER EXPONENTS INTRO

n^{-3}	n^{-2}	n^{-1}	n^{0}	n^{1}	n^{2} (squaring)	n^{3} (cubing)	Rule For the Row
1^{-3}	1^{-2}	1^{-1}	1^{0}	1^{1}	1^{2}	1^{3}	
2^{-3}	2^{-2}	2^{-1}	2^{0}	2^{1}	2^{2}	2^{3}	
3^{-3}	3^{-2}	3^{-1}	3^{0}	3^{1}	3^{2}	3^{3}	
4^{-3}	4^{-2}	4^{-1}	4^{0}	4^{1}	4^{2}	4^{3}	
5^{-3}	5^{-2}	5^{-1}	5^{0}	5^{1}	5^{2}	5^{3}	
10^{-3}	10^{-2}	10^{-1}	10^{0}	10^{1}	10^{2}	10^{3}	
$(-1)^{-3}$	$(-1)^{-2}$	$(-1)^{-1}$	$(-1)^{0}$	$(-1)^{1}$	$(-1)^{2}$	$(-1)^{3}$	
$(-2)^{-3}$	$(-2)^{-2}$	$(-2)^{-1}$	$(-2)^{0}$	$(-2)^{1}$	$(-2)^{2}$	$(-2)^{3}$	

What do you notice about a number to a positive exponent and the same number to its opposite exponent (i.e. 3^{2} and 3^{-2}?

_____

_____

Name _____

An Alternative Approach to Negative Exponents

4^{-3} means the same as $\left(\frac{1}{4}\right)^3$

Notice that the following changed:

- The base became its _____.
- The exponent became its _____.

$\left(\frac{1}{4}\right)^3$ means $\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)$, which has a value of _____.

In summary:

- 4^3 = _____ so 4^{-3} = _____
- They are _____.

Independent Practice

6^{-2} means the same as _____ **6^2 = _____ so 6^{-2} = _____**	**8^{-1} means the same as _____** **8^1 = _____ so 8^{-1} = _____**	**10^{-4} means the same as _____** **10^4 = _____ so 10^{-4} = _____**

Name _____

INTEGER EXPONENTS INTRO

ANSWER KEY

n^{-3}	n^{-2}	n^{-1}	n^{0}	n^{1}	n^{2} (squaring)	n^{3} (cubing)	Rule For the Row
1^{-3} 1	1^{-2} 1	1^{-1} 1	1^{0} 1	1^{1} 1	1^{2} 1	1^{3} 1	Times 1 from left to right or 1 to any power is 1
2^{-3} 1/8	2^{-2} 1/4	2^{-1} 1/2	2^{0} 1	2^{1} 2	2^{2} 4	2^{3} 8	Times 2 from left to right Divide by 2 from right to left
3^{-3} 1/27	3^{-2} 1/9	3^{-1} 1/3	3^{0} 1	3^{1} 3	3^{2} 9	3^{3} 27	Times 3 from left to right Divide by 4 from right to left
4^{-3} 1/64	4^{-2} 1/16	4^{-1} 1/4	4^{0} 1	4^{1} 4	4^{2} 16	4^{3} 64	Times 4 from left to right Divide by 4 from right to left
5^{-3} 1/125	5^{-2} 1/25	5^{-1} 1/5	5^{0} 1	5^{1} 5	5^{2} 25	5^{3} 125	Times 5 from left to right Divide by 5 from right to left
10^{-3} 1/1000	10^{-2} 1/100	10^{-1} 1/10	10^{0} 1	10^{1} 10	10^{2} 100	10^{3} 1000	Times 10 from left to right Divide by 10 from right to left
$(-1)^{-3}$ -1	$(-1)^{-2}$ 1	$(-1)^{-1}$ -1	$(-1)^{0}$ 1	$(-1)^{1}$ -1	$(-1)^{2}$ 1	$(-1)^{3}$ -1	Times negative 1 from left to right
$(-2)^{-3}$ -1/8	$(-2)^{-2}$ 1/4	$(-2)^{-1}$ -1/2	$(-2)^{0}$ 1	$(-2)^{1}$ -2	$(-2)^{2}$ 4	$(-2)^{3}$ -8	Times negative 2 from left to right

What do you notice about a number to a positive exponent and the same number to its opposite exponent (i.e. 3^{2} and 3^{-2}?

When simplified, the values in standard form are reciprocals, which means that when multiplied together they have a product of 1.

Name _____

An Alternative Approach to Negative Exponents

4^{-3} means the same as $\left(\frac{1}{4}\right)^3$

Notice that the following changed:

- The base became its reciprocal.
- The exponent became its opposite.

$\left(\frac{1}{4}\right)^3$ means $\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)\left(\frac{1}{4}\right)$, which has a value of 1/64.

In summary:

- $4^3 = 64$ so $4^{-3} = 1/64$
- They are reciprocals.

Independent Practice

6^{-2} means the same as $\frac{1}{6^2}$ **$6^2 = 36$ so $6^{-2} = 1/36$**	**8^{-1} means the same as $\frac{1}{8^1}$** **$8^1 = 8$ so $8^{-1} = 1/8$**	**10^{-4} means the same as $\frac{1}{10^4}$** **$10^4 = 10000$ so $10^{-4} = 1/10000$**