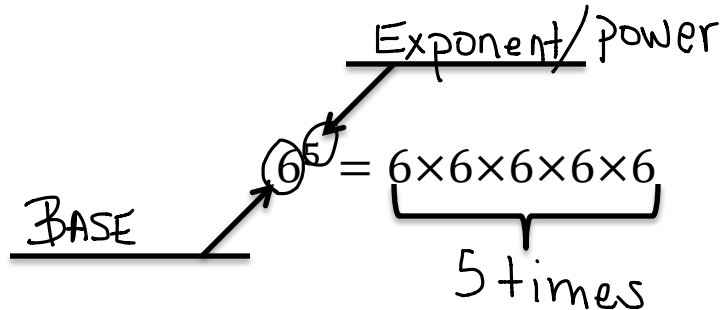


LEARNING OBJECTIVE: We will write expressions using correct exponential notation. (G8M1L1)

CONCEPT DEVELOPMENT:

Exponential notation is an easier way to write repeated multiplication.



Fractional or Negative Bases NEED parentheses

Examples:

$$\left(\frac{9}{7}\right)^4 = \frac{9}{7} \times \frac{9}{7} \times \frac{9}{7} \times \frac{9}{7}$$

Non-examples:

$$\frac{9^4}{7} = \frac{9 \times 9 \times 9 \times 9}{7}$$

$$(-2)^4 = (-2) \times (-2) \times (-2) \times (-2)$$

$$-2^4 = -(2 \times 2 \times 2 \times 2)$$

When a **negative** base is raised to an **odd** power, the result is **negative**.

When a **negative** base is raised to an **even** power, the result is **positive**.

GUIDED PRACTICE:

Steps for Writing in Exponential Form

1. Identify the base, and count how many times it is being multiplied.
2. Make sure that you are using parentheses appropriately.

$\underbrace{3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3}_{8 \text{ times}} \quad 3^8$	$\underbrace{(-6) \times (-6) \times (-6) \times (-6) \times (-6)}_{(-6)^5}$
$\underbrace{(-6.7) \times (-6.7) \times (-6.7) \times (-6.7)}_{(-6.7)^4}$	$\frac{5}{4} \times \frac{5}{4} \times \frac{5}{4} \quad \left(\frac{5}{4}\right)^3$
$\underbrace{d \times d \times d \times d}_{d^4}$	$12c^4 \quad \underbrace{12c \times 12c \times 12c \times 12c}_{(12c)^4}$

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

INDEPENDENT PRACTICE:**Steps for Writing in Exponential Form**

1. Identify the base, and count how many times it is being multiplied.
2. Make sure that you are using parentheses appropriately.

$1.5 \times 1.5 \times 1.5$	$(-1)(-1)(-1)(-1)(-1)(-1)$
$(-2x)(-2x)(-2x)(-2x)$	$\left(-\frac{8}{3}\right)\left(-\frac{8}{3}\right)\left(-\frac{8}{3}\right)\left(-\frac{8}{3}\right)\left(-\frac{8}{3}\right)\left(-\frac{8}{3}\right)$
What value of n will make the number positive? $\left(-\frac{2}{9}\right)^n$	What value of n will make the number negative? $(-123)^n$
Write an expression with $\left(-\frac{6}{5}\right)$ as its base that will produce a positive product.	Write an expression with (-68) as its base that will produce a negative product.
Rewrite each number in exponential form using 2 as the base: 8 = 16 = 32 = 64 = 128 = 256 =	Could (-2) be used to rewrite 32? Why or why not?

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ACTIVATING PRIOR KNOWLEDGE:

We know that multiplication is the same as repeated addition.

$2 + 2 + 2 + 2 + 2 + 2 + 2 = 14$ 7 times $7 \times 2 = 14$	$(-3) + (-3) + (-3) + (-3)$ $-3 \cdot 4$ $4 \times$
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CLOSURE:

1. Amy and Beth were both trying to rewrite the following expression using exponential notation:

$$3s \times 3s \times 3s \times 3s \times 3s$$

Amy said correct notation would be to rewrite this expression as $3s^5$ while Beth said it was $(3s)^5$. Who is correct? Justify your answer.

2. Explain why -3^2 is different than $(-3)^2$.

TEACHER NOTES:

Do number talk— $29 + 38$, then $239 + 398$.

Give Engage NY exit ticket.