EXPONENTS

Recall: Another way to write $3+3+3+3$ is _____

similarly, another way to write $3 \cdot 3 \cdot 3 \cdot 3$ is _____

For the expression 3^4, 3 is known as the _____ and 4 is known as the _____

example 1:

write x^3 in expanded form.

$x^3 =$ _____

example 2:

Evaluate $x^3 \cdot x^4$

$x^3 =$ _____

$x^4 =$ _____

so $x^3 \cdot x^4 =$ _____ · _____

$=$ _____

NOTE: We add the exponents.

example 3:

evaluate $3x + 4x$

$3x =$ _____

$4x =$ _____

So $3x + 4x =$ _____ + _____

$=$ _____

NOTE: x^3 is said, "x raised to the third power."

x^4 is said, "x raised to the fourth power."

example 4:

Evaluate:

a) $5^2 = 5 \cdot 5 =$ _____

b) $2^4 = 2 \cdot 2 \cdot 2 \cdot 2 =$ _____

c) $2^6 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

$= 2^4 \cdot 2 \cdot 2$

$=$ _____ $\cdot 2 \cdot 2$

$=$ _____

d) $2^7 = 2^6 \cdot 2 =$ _____ $\cdot 2 =$ _____

example 5:

Evaluate 3^0

Consider:

$3^4 = 3 \cdot 3 \cdot 3 \cdot 3 =$

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

$3^2 = 3 \cdot 3 =$

$3^1 = 3 =$

To get from 3^4 to 3^3, we need to divide by 3.

Similarly, $3^2 = 3^3 \div 3 =$

$3^1 = 3^2 \div 3 =$

Following this pattern,

$3^0 = 3^1 \div 3 =$

with this in mind, we can make the following general statement:

Any number (except zero) raised to the zero power is

NOTE: 0^0 is undefined since $0^0 = 0^1 \div 0 = \frac{0}{0}$ which is undefined.

EXPONENTS Practice Problems

1. Write x^4 in expanded form.

2. Evaluate $x^2 \cdot x^3$

3. Evaluate $4x + 5x$

4. Write 2^4 in a word statement.

5. Evaluate:
   a) 3^0
   b) 3^3
   c) 3^4
   d) 3^5