Section 2.1 Notes

When an integer, other than 0, can be written as a product of equal factors, we can write the integer as a _____________.

Example: \(5 \times 5 \times 5\) is \(5^3\)

Where 5 is the ________

3 is the _________ (how many factors of 5)

\(5^3\) is the _______

And \(5^3\) is a power of ___

We say 5 to the _______ or 5 __________.

**NOTE:** A power with an integer base and exponent 2 is a ____________ number, and a power with an integer base and exponent of 3 is a ________ number.

**Example #1**

Write the following as powers

(a) \(3 \times 3 \times 3 \times 3 \times 3 \times 3\)

(b) 7

**Note:** The base is the number that is multiplied over and over. The number of times it is multiplied over and over is the exponent.

**Example #2**

Write the following as repeated multiplication and in standard form.

(a) \(3^5\)

(b) \(7^4\)

**Note:** when you evaluate the power to get the number it represents this answer is said to be in standard form.

**Example #3**

Identify the base of the power and evaluate.

(a) \((-3)^4\)

(b) \(-3^4\)

**CONSIDER:**
- Why are these different?
- How are they the same?
Practice 2.1:

1. Identify the base in each of the following powers and evaluate. * Remember that the base is only what the exponent applies to. In order for it to apply to a negative integer, it must be outside of the negative integer in brackets.

   a. \((-2)^4\)
   b. \((3^4)\)
   c. \(6^2\)
   d. \(-6^2\)
   e. \(-6^2\)
   f. \((-3)^3\)
   g. \(-(-2^2)\)

2. Evaluate \(-3^3\) and \((-3)^3\)? How are they similar? How are they different?

3. Write each product as a power; then evaluate.
   a. \(5 \times 5\)
   b. \(10 \times 10 \times 10 \times 10\)
   c. \((-2) \times (-2) \times (-2)\)
   d. \(-(-4) \times (-4) \times (-4)\)

4. When does a negative base in a power produce a negative product? Give 3 examples.

5. Write each number as a power with base 2.
   a. 4
   b. 16
   c. 128
   d. 64