2.1 Notes What is a Power?

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

For example, $5 \times 5 \times 5$ is 5^3

5 is the base.

3 is the exponent.

5^3 is the power.

5^3 is a power of 5.

We say: 5 to the 3rd or 5 cubed.

- A power with an integer base and exponent 2 is a square number.
- A power with an integer base and exponent 3 is a cube number.

Writing Powers

Example #1: Write as a power:

a) $3 \times 3 \times 3 \times 3 \times 3 \times 3$
The base is 3. There are 6 equal factors so the exponent is 6. Therefore the power is 3^6.

b) 7
The base is 7 and there is only one factor. Therefore the power is 7^1.

Evaluating Powers

Example #2: Write as repeated multiplication and in standard form.

a) 3^5
$3^5 = 3 \times 3 \times 3 \times 3 \times 3$
= 243

b) 7^4
$7^4 = 7 \times 7 \times 7 \times 7$
=2401

Evaluating Expressions Involving Negative Signs

Example #3: Identify the base of each power, then evaluate the power.

a) $(-3)^4$ so the base is -3. This means $-3 \times -3 \times -3 \times -3$ There are 4 negatives (remember your integer rules) so the answer will be positive. So, $(-3)^4 = 81$

b) -3^4 The base is 3. The exponent applies only to the base and not to the negative sign. This means $-(3 \times 3 \times 3 \times 3)$. So $-3^4 = -81$

Assignment: Pages 55-57. We will only be doing some of the questions. Check the wiki to see which ones if you are