

## Unit 2 (chp 5) Powers and Roots

### Section 5.1 Powers with Integers and Rational- Number Bases (p. 191-194)

Recall powers with positive bases:

$$10^3 \quad \begin{array}{l} \longleftarrow \text{exponent} \\ \longleftarrow \text{base} \end{array}$$

We say : “10 to the 3” or “10 to the power of 3”

The **base** is 3. The base is the number repeatedly multiplied  
The **exponent** is 4. The exponent is the number of times the base is multiplied.

We write as:  $\underbrace{10^3}_{\text{power form}} = \underbrace{10 \times 10 \times 10}_{\text{expanded form}} = \underbrace{1000}_{\text{standard form}}$

**EX. 1** Evaluate each power:

(a)  $5^2 = 5 \times 5 = 25$

(b)  $(-3)^4 = (-3) \times (-3) \times (-3) \times (-3) = 81$

(c)  $(-3)^4 = -(3 \times 3 \times 3 \times 3) = -(81) = -81$

(d)  $\left(-\frac{5}{4}\right)^2 = \left(-\frac{5}{4}\right)\left(-\frac{5}{4}\right) = \left(\frac{25}{16}\right)$       *or*       $\left(-\frac{5}{4}\right)^2 = \frac{(-5)^2}{(4)^2} = \frac{25}{4}$

(e)  $\left(\frac{1}{2}\right)^3 = \left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{8}$

**EX. 2** Evaluate:

(a)  $(-2)^3 + (3)^2 = (-2) \times (-2) \times (-2) + (3) \times (3)$   
 $= -8 + 9$   
 $= 1$

Always remember  
order of operations!

(b)  $3(-4)^2 - 7^2 = 3[(-4) \times (-4)] - (7 \times 7)$   
 $= 3[16] - 49$   
 $= 48 - 49$   
 $= -1$