

Honors Algebra II

Notes Section 3.1

Evaluate nth Roots and Use Rational Exponents

nth Root: _____

Real nth Roots

Even Integer Odd Integer

index: _____

$a < 0$	No Real	1 Real
$a = 0$	1 Real	1 Real
$a > 0$	2 Real	1 Real

$a^{1/2} =$ _____

$a^{1/3} =$ _____

$a^{1/4} =$ _____

Rational Exponents: $a^{m/n} =$ _____

$a^{-m/n} =$ _____

EXAMPLE 1 Find the indicated real nth root(s).

a) $n = 3$

$a = -216$

b) $n = 4$

$a = 81$

EXAMPLE 2 Evaluate.

a) $16^{3/2} =$ _____

b) $32^{-3/5} =$ _____

c) $125^{2/3} =$ _____

d) $8^{-4/3} =$ _____

EXAMPLE 3 Approximate with a calculator.

a) $9^{1/5} =$ _____

b) $12^{3/8} =$ _____

c) $(\sqrt[4]{7})^3 =$ _____

EXAMPLE 4 Solve the equation.

a) $4x^5 = 128$

b) $(x-3)^4 = 21$

c) $(x-8)^5 = 100$

Example 5 A study determined that the weight w (in grams) of coral cod near Palawan Island, Philippines, can be approximated using

$$w = 0.0167l^3$$

where l is the coral cod's length (in centimeters). **Estimate the length of a coral cod that weighs 200 grams.**