$\sqrt{}$ This symbol is called a radical

it indicates finding a root.

The number in this spot is called the Index.

It tells what root you are to find.

If there is no index it means Square Root.

This quantity is called the Radicand

$$4^{\frac{1}{2}} = \sqrt{4}$$

Rational exponents represent radicals.

The denominator of the rational exponent represents the INDEX of the radical.

If $4^{\frac{1}{2}} = \sqrt{4}$, then

what do these represent?

$4^{\frac{1}{3}} = \sqrt[3]{4}$ the cube root of 4

$4^{\frac{1}{4}} = \sqrt[4]{4}$ the fourth root of 4

$4^{\frac{1}{5}} = \sqrt[5]{4}$ the fifth root of 4

What would this represent?

$4^{\frac{1}{n}} = \sqrt[n]{4}$ the "nth" root of 4

If $\sqrt{x} = x^{\frac{1}{2}}$

How would you write this as a power of x? $\sqrt{x^3}$

$= (x^3)^{1/2} = x^{\frac{3}{2}}$

$a^{\frac{1}{n}} = \sqrt[n]{a}$ "the nth root of a"

The denominator of the rational exponent represents the INDEX of the radical.

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} \text{ or } (\sqrt[n]{a})^m$$

Get a small white board, marker, and rag.

Write in exponential form:

This means to write each using rational exponents.

1. $\sqrt[4]{g^9}$ $g^{\frac{9}{4}}$

2. $\sqrt{h^5}$ $h^{5/2}$

3. $\sqrt[7]{a}$ $a^{\frac{1}{7}}$

Write in exponential form:

4. $\sqrt[5]{3c^2}$ $= (3c^2)^{1/5}$ or $3^{1/5}c^{2/5}$

5. $\sqrt[4]{(11e)^7}$ $= (11e)^{7/4}$ or $11^{7/4}e^{7/4}$

Write in exponential form:

6. $\sqrt[9]{x^3}$

$= x^{3/9}$

or $x^{1/3}$

7. $\sqrt{(2mn)^8}$

$= ((2mn)^8)^{1/2}$

$= (2mn)^4$

or $16m^4n^4$

Write each in radical form.

1. $w^{\frac{2}{11}}$

$= \sqrt[11]{w^2}$

or $\left(\sqrt[11]{w}\right)^2$

2. $k^{\frac{5}{2}}$

$= \sqrt{k^5}$

or $\left(\sqrt{k}\right)^5$

3. $x^{\frac{1}{7}}$

$= \sqrt[7]{x}$

Write each in radical form.

4. $m^{2.5}$

$2.5 = 2\frac{1}{2} = 5/2$

$m^{5/2}$

$= \sqrt{m^5}$

or $\left(\sqrt{m}\right)^5$

5. $c^{3.1}$

$3.1 = 3\frac{1}{10} = \frac{31}{10}$

$c^{31/10}$

$= \sqrt[10]{c^{31}}$

or $\left(\sqrt[10]{c}\right)^{31}$

6. $w^{-\frac{3}{7}}$

$= \frac{1}{w^{3/7}}$ or $\left(\frac{1}{w}\right)^{3/7}$

$= \frac{1}{\sqrt[7]{w^3}}$

or $\sqrt[7]{\frac{1}{w^3}}$

You can now finish Hwk #31

Sec 7-4 *Due Monday*

Page 388

Problems: 11, 12, 14, 16, 17, 19, 20, 22-24