INSTRUCTOR GUIDANCE EXAMPLE: Week Three Discussion
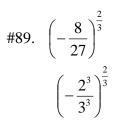
Simplifying Radicals

1. Simplify each expression using the rules of exponents and explain the steps you are taking.
2. Next, write each expression in the equivalent radical form and demonstrate how it can be simplified in that form, if possible.
3. Which form do you think works better for the simplification process and why?

#51. $(2^{-4})^{1/2}$ The exponent working on an exponent calls for the **Power Rule**.

$2^{(-4*1/2)}$ The exponents multiply each other.

2^{-2} -4*1/2 = -2 so the new exponent is -2.

$\dfrac{1}{2^2}$ The negative exponent makes a **reciprocal** of base number and exponent.

$\dfrac{1}{4}$ The final simplified answer is ¼. This is the **principal root** of the square root of 2^{-4}.

#63. $\left(\dfrac{81x^{12}}{y^{20}}\right)^{\frac{1}{4}}$ The **Power Rule** will be used again with the outside exponent

$\left(\dfrac{3^{4\cdot\frac{1}{4}}x^{12\cdot\frac{1}{4}}}{y^{20\cdot\frac{1}{4}}}\right)$ multiplying both the inner exponents. $81 = 3^4$

$\dfrac{3x^3}{y^5}$ 4*1/4 = 1,   12*1/4 = 3,   and   20*1/4 = 5

    All inner exponents were multiples of 4 so no rational exponents are left.

#89. $\left(-\dfrac{8}{27}\right)^{\frac{2}{3}}$ First rewrite each number as a prime to a power.

$\left(-\dfrac{2^3}{3^3}\right)^{\frac{2}{3}}$ Use the **Power Rule** to multiply the inner exponents.

    The negative has to be dealt with somewhere so I will put it with the 2 in the numerator.

$\dfrac{(-2)^{3\cdot\frac{2}{3}}}{3^{3\cdot\frac{2}{3}}}$ 3*2/3 = 2 in both numerator and denominator.

$$\frac{(-2)^2}{3^2} = \frac{4}{9}$$ The squaring eliminates the negative for the answer.

It turns out that the examples I chose to work out here didn't use all of the vocabulary words and required one which wasn't on the list. Students should be sure to use words appropriate to the examples they work on.