

### ① Radicals & Rational Exponents

Write the following expression in radical form.

$$8^{\frac{1}{2}} \sqrt{8}$$

\* 2 is not written

$$8^{\frac{1}{4}} \rightarrow \sqrt[4]{8}$$

$$8^{\frac{1}{3}} \rightarrow \sqrt[3]{8}$$

$$8^{\frac{1}{5}} \rightarrow \sqrt[5]{8}$$

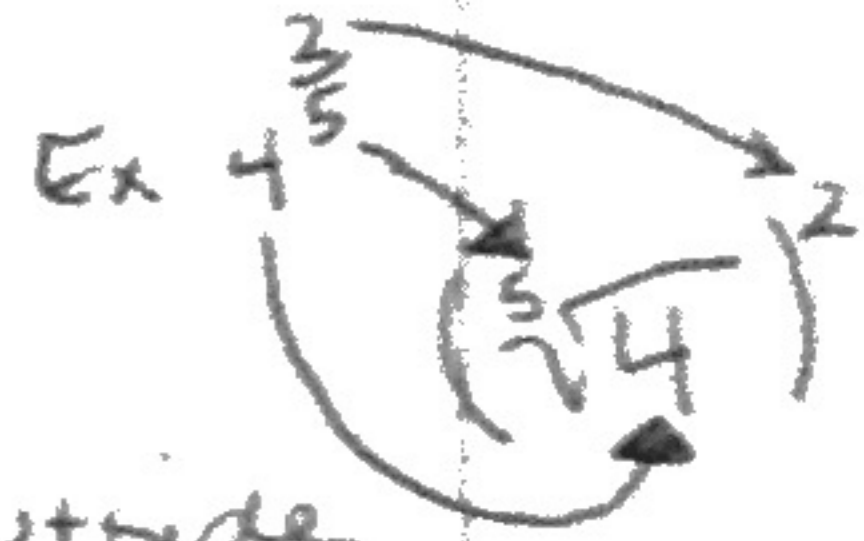
The denominator becomes the root.

### ② Radicals & Rational Exponents

Write the following expression in radical form.

$$4^{\frac{7}{3}} \left( \sqrt[3]{4} \right)^7 \quad 2^{\frac{5}{2}} \left( \sqrt{2} \right)^5$$

Base becomes # inside  $\sqrt{\quad}$   
 Denominator becomes the root  
 Numerator becomes the exponent outside



### ③ Radicals & Rational Exponents

Write the following expression in exponential form.

Square root  $\rightarrow 2$

no exponent?  
 assume it is a 1

$$(\sqrt{8})^9 \rightarrow 8^{\frac{9}{2}}$$

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

# inside becomes the base  
 the  $n^{\text{th}}$  root becomes the denominator  
 the outside exponent becomes the numerator

ex  $(\sqrt[3]{7})^4 \rightarrow 7^{\frac{4}{3}}$   
 4 - outside exponent  
 3 - from the root  
 - from inside radical

### ④ Radicals & Rational Exponents

Write the following expression in radical form.

$$(3x)^{-\frac{5}{2}} \frac{1}{(3x)^{\frac{5}{2}}} = \frac{1}{(\sqrt{3x})^5}$$

Negative exponent? put everything under 1 and the fraction bar  
 Then solve like the others in slide 2

5 Radicals & Rational Exponents

Write the following expression in exponential form.

$$(\sqrt[3]{x})^2 \quad x^{\frac{2}{3}}$$

$\hookrightarrow (x^{\frac{1}{3}})^2$  then  $x^{\frac{1}{3} \cdot 2} = x^{\frac{2}{3}}$

$$(\sqrt[4]{x})^7 \quad (x^{\frac{1}{4}})^7 = x^{\frac{1}{4} \cdot 7} = x^{\frac{7}{4}}$$

6 Radicals & Rational Exponents

Simplify.

$$64^{\frac{1}{2}} = \sqrt{64} = 8$$

$$(81x^8)^{\frac{1}{2}} \quad \sqrt{81x^8} = \sqrt{81} \cdot \sqrt{x^8}$$
$$= 9 \cdot x^4 = 9x^4$$