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Radical Expression

Ex:

$$\sqrt[3]{250 a^4 b^5} = \sqrt[3]{2 \cdot \underbrace{5 \cdot 5 \cdot 5} \cdot \underbrace{a \cdot a \cdot a} \cdot a \cdot \underbrace{b \cdot b \cdot b} \cdot b \cdot b}$$

$$= 5ab \sqrt[3]{2 \cdot a \cdot b} = 5ab \sqrt[3]{2ab^2}$$

$\begin{matrix} & 10 & 25 \\ & / & / \\ \textcircled{2} & \textcircled{5} & \textcircled{5} & \textcircled{5} \end{matrix}$

Ex:

$$\sqrt[9]{8 a^3 b^6} = \sqrt[9]{2^3 a^3 b^6}$$

$$= \sqrt[9/3]{2^{3/3} a^{3/3} b^{6/3}}$$

$$= \sqrt[3]{2^1 a^1 b^2}$$

Notice 8 is a  
chart number  
so we need to rewrite it.

They all have  
a common factor  
of 3 so now  
we can divide  
all of the exponents  
by 3

Ex:

$$\sqrt[12]{625 x^4 y^8} = \sqrt[12]{5^4 x^4 y^8}$$

$$= \sqrt[12/4]{5^{4/4} x^{4/4} y^{8/4}}$$

$$= \sqrt[3]{5^1 x^1 y^2}$$

chart number

They all share  
a common factor  
of 4.