

$$\sqrt[5]{7^1 x^{10} y^1} = \sqrt[5]{7^{\frac{1}{5}} x^{\frac{10}{5}} y^{\frac{1}{5}}} = \sqrt[5]{7^{\frac{1}{5}} x^2 y^{\frac{1}{5}}}$$

$$\sqrt{88 w^{13} x^1} = \sqrt{88^{\frac{1}{2}} w^{\frac{13}{2}} x^{\frac{1}{2}}} \quad \sqrt{2^3 \cdot 11^1 w^{\frac{13}{2}} x^{\frac{1}{2}}}$$

$88 = 2^3 \cdot 11^1$

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 better answer

Since $64 = 2^6$

$$64^{\frac{1}{5}} x^{\frac{6}{5}} y^{\frac{3}{5}} = \sqrt[5]{64 x^6 y^3} = \sqrt[5]{3^3 \cdot 2^6} \sqrt[5]{x^6 y^3}$$

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

$16 = 2^4$

$$16^{\frac{1}{8}} x^{\frac{5}{8}} y^1 = \sqrt[8]{16 x^5 y^8}$$

$1024 = 2^{10}$

$$\sqrt{1024 x^{16} y^6} = \sqrt{1024} \sqrt{x^{16}} \sqrt{y^6}$$

$$= \sqrt{2^{10}} \sqrt{x^{16}} \sqrt{y^6}$$

$$= 2^{\frac{10}{2}} x^{\frac{16}{2}} y^{\frac{6}{2}} = 2^5 x^8 y^3$$

$$= \textcircled{32 x^8 y^3}$$

Error Analysis x^4 should be x^8

$$\frac{1}{\sqrt[3]{36}} \cdot \frac{\sqrt[3]{6}}{\sqrt[3]{6}} = \frac{\sqrt[3]{6}}{\sqrt[3]{216}} = \boxed{\frac{\sqrt[3]{6}}{6}}$$

since $36 = 2^2 \cdot 3^2$

$$\text{OR } \frac{1}{\sqrt[3]{36}} \cdot \frac{\sqrt[3]{36^2}}{\sqrt[3]{36^2}} = \frac{\sqrt[3]{36^2}}{\sqrt[3]{36^3}} = \frac{\sqrt[3]{36^2}}{36}$$

$$\frac{\sqrt[3]{1296}}{36} = \frac{\sqrt[3]{216} \sqrt[3]{6}}{36} = \frac{6 \sqrt[3]{6}}{36} = \frac{6}{36} \cdot \frac{\sqrt[3]{6}}{1}$$

note $1296 = 2^4 \cdot 3^4$

$$= \boxed{\frac{\sqrt[3]{6}}{6}}$$

Error Analysis should have

multiplied by $\frac{\sqrt[3]{36^2}}{\sqrt[3]{36^2}}$ or $\frac{\sqrt[3]{6}}{\sqrt[3]{6}}$

$$15 = 3 \cdot 5$$

$$\begin{aligned}\sqrt[3]{15x^{54}y^{12}} &= \sqrt[3]{15} \sqrt[3]{x^{54}} \sqrt[3]{y^{12}} \\ &= \sqrt[3]{15} x^{54/3} y^{12/3} \\ &= \sqrt[3]{15} x^{18} y^4 \\ &= \boxed{x^{18} y^4 \sqrt[3]{15}}\end{aligned}$$

Error analysis $\sqrt[3]{15}$ is simplified

$$\sqrt[3]{y^{12}} = y^4 \text{ not } y^9 \leftarrow \begin{array}{l} \text{subtracted} \\ 3 \end{array}$$

$$\begin{aligned}\sqrt[3]{-64x^9y^5} &= \sqrt[3]{-64} \sqrt[3]{x^9} \sqrt[3]{y^5} \\ &= -4 x^{9/3} \sqrt[3]{y^3 \cdot y^2} = -4 x^3 y^{3/3} \sqrt[3]{y^2} \\ &= \boxed{-4x^3 y \sqrt[3]{y^2}}\end{aligned}$$

$$\left[\frac{(36 x^2 y^7)^3}{125 x^{30} y^{-10}} \right]^{-1/3}$$

Note $36 = 2^2 3^2$
 $125 = 5^3$

$$\left[\frac{36^3 x^6 y^{21}}{125 x^{30} y^{-10}} \right]^{-1/3} = \left[\frac{36^3 x^6 y^{21} y^{10}}{125 x^{30}} \right]^{-1/3}$$

$$= \frac{36^{-1} x^{-2} y^{-3/3}}{125^{-1/3} x^{-10}}$$

$$= \frac{125^{1/3} x^{10}}{36^1 x^2 y^{3/3}} = \frac{5 x^8}{36} \frac{1}{y^{10/3}}$$

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 $\frac{5x^8}{36y}$

$$= \frac{5}{36} \frac{x^8}{1} \frac{1}{y^{10} y^{1/3}}$$

$$= \frac{5}{36} \frac{x^8}{1} \frac{1}{y^{10} \sqrt[3]{y}}$$

$$= \frac{5 x^8}{36 y^{10}} \frac{1}{\sqrt[3]{y}} \frac{\sqrt[3]{y^2}}{\sqrt[3]{y^2}} = \frac{5 x^8 \sqrt[3]{y^2}}{36 y^{10} \sqrt[3]{y^3}} = \frac{5 x^8 \sqrt[3]{y^2}}{36 y^{11}}$$

$$\begin{aligned} \sqrt{\frac{8x^8y^{15}}{512x^1y^{21}}} &= \sqrt{\frac{1}{64}} \sqrt{\frac{x^7}{1}} \sqrt{\frac{1}{y^6}} = \frac{1}{\sqrt{64}} \frac{\sqrt{x^7}}{1} \frac{1}{\sqrt{y^6}} \\ &= \frac{1}{8} \frac{\sqrt{x^6 x^1}}{1} \cdot \frac{1}{y^{3/2}} = \frac{1}{8} \frac{x^{6/2} \sqrt{x^1}}{1} \frac{1}{y^3} \\ &= \frac{1}{8} \frac{x^3 \sqrt{x}}{1} \frac{1}{y^3} = \frac{x^3 \sqrt{x}}{8y^3} \end{aligned}$$

$$\frac{\sqrt{8} \sqrt{x^8} \sqrt{y^{15}}}{\sqrt{512} \sqrt{x^1} \sqrt{y^{21}}} = \frac{\sqrt{4} \sqrt{2} x^{8/2} \sqrt{y^{10}} \sqrt{y^1}}{\sqrt{256} \sqrt{2} \sqrt{x} \sqrt{y^{20}} \sqrt{y^1}}$$

$$= \frac{2\sqrt{2}}{16\sqrt{2}} \cdot \frac{x^4}{\sqrt{x}} \frac{y^7 \sqrt{y}}{y^{10} \sqrt{y}}$$

$$= \frac{1}{8} \cdot \frac{x^4}{1} \frac{1}{y^3} \frac{1}{\sqrt{x}} = \frac{x^4}{8y^3} \frac{1}{\sqrt{x}} \cdot \frac{\sqrt{x}}{\sqrt{x}}$$

$$= \frac{x^4 \sqrt{x}}{8y^3 x} = \frac{x^3 \sqrt{x}}{8y^3}$$

$$\sqrt[3]{\frac{125x^{24}}{216x^9y^9}} = \frac{\sqrt[3]{125}}{\sqrt[3]{216}} \sqrt[3]{\frac{x^{24}}{x^9}} \sqrt[3]{\frac{1}{y^9}}$$

$$= \frac{5}{6} \sqrt[3]{\frac{x^{15}}{1}} \frac{1}{y^{9/3}}$$

$$= \frac{5}{6} \frac{x^5}{1} \frac{1}{y^3}$$

$$= \frac{5}{6} \frac{x^5}{1} \frac{1}{y^3} = \frac{5x^5}{6y^3}$$

$$\frac{5x^5}{6y^3}$$

$$\frac{\sqrt[3]{125x^{24}}}{\sqrt[3]{216x^9y^9}}$$

$$= \frac{\sqrt[3]{125} \sqrt[3]{x^{24}}}{\sqrt[3]{216} \sqrt[3]{x^9} \sqrt[3]{y^9}} = \frac{5x^8}{6x^3y^3}$$

$$= \frac{5}{6} \frac{x^8}{x^3} \frac{1}{y^3} = \frac{5x^5}{6y^3}$$

$$\frac{5x^5}{6y^3}$$

$$\left[\frac{(36x^2y^7)^3}{12x^{30}y^{-10}} \right]^{-\frac{1}{3}} = \left[\frac{(2^2 \cdot 3^2 x^2 y^7)^3}{5^3 x^{30} y^{-10}} \right]^{-\frac{1}{3}}$$

$$= \left[\frac{2^6 \cdot 3^6 x^6 y^{21}}{5^3 x^{30} y^{-10}} \right]^{-\frac{1}{3}}$$

$$2^{-2} \cdot 3^{-2} x^{-2} y^{-7}$$

$$5^{-1} x^{-10} y^{+\frac{10}{3}}$$

$$\frac{5^1}{2^2} \frac{1}{3^2} \frac{x^{10}}{x^2} \frac{1}{y^7} y^{\frac{10}{3}}$$

$$\frac{5}{36} x^8 \frac{1}{y^{\frac{21}{3}}} \frac{1}{y^{\frac{10}{3}}}$$

$$\left[\frac{5x^8}{36y^{\frac{31}{3}}} \right]$$

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$$\frac{5x^8}{36 \sqrt[3]{y^{20}} \sqrt[3]{y^1}} \cdot \frac{1}{\sqrt[3]{y^2} \sqrt[3]{y^2}}$$

$$\frac{5x^8 \sqrt[3]{y^2}}{36y^{11}}$$