

Side one $10^{\frac{2}{6}} = (\sqrt[6]{10})^7$

Side two $(49x^4)^{\frac{1}{2}}$ Exponent rules

Two Methods

Method 1 (Blue): $\sqrt{49x^4} = \sqrt{49} \cdot \sqrt{x^4} = 7x^2$

Method 2 (Red): $49^{\frac{1}{2}} \cdot x^{2} = \sqrt{49} \cdot x^2 = 7x^2$

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$(10,000x^{\frac{5}{4}})^{\frac{4}{5}}$

$10,000^{\frac{4}{5}} \cdot x^{\frac{5}{4} \cdot \frac{4}{5}} = 10^4 \cdot x^1 = 10,000x$

Multiply (exponent rules) $\frac{5}{4} \cdot \frac{4}{5} = 1$

$(\sqrt[4]{10,000})^5 \cdot x^{10} = (10)^5 \cdot x^{10} = 100,000x^{10}$

Power of 10s:

- $10^1 = 10$
- $10^2 = 100$
- $10^3 = 1,000$
- $10^4 = 10,000$

Radical forms:

- $\sqrt{100} = 10$ ($10 \cdot 10$)
- $\sqrt[3]{1,000} = 10$ ($10 \cdot 10 \cdot 10$)
- $\sqrt[4]{10,000} = 10$ ($10 \cdot 10 \cdot 10 \cdot 10$)

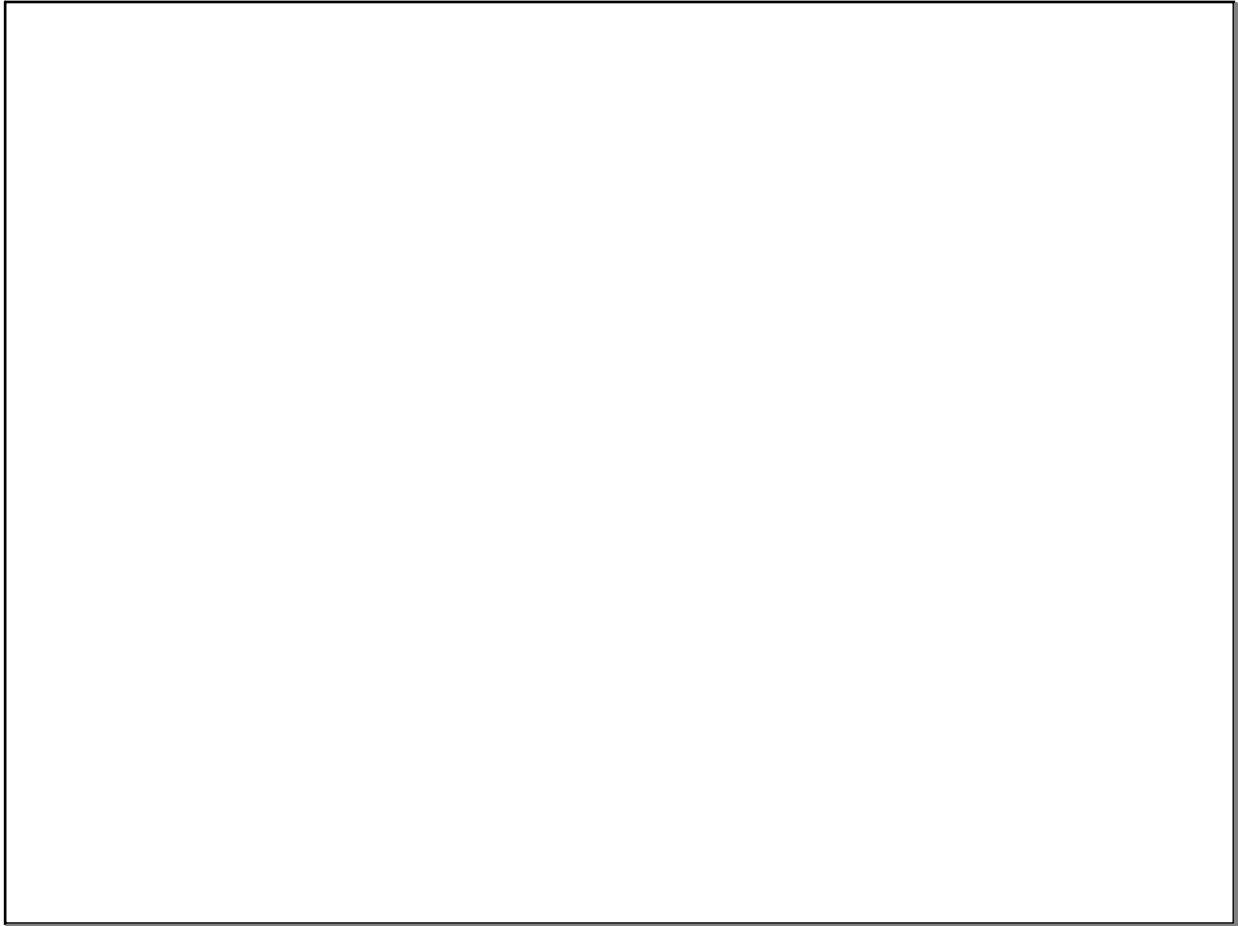
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$$\begin{aligned}
 & (64 \times 4)^{\frac{2}{3}} \\
 & 64^1 \times 4^{\frac{2}{3}} \\
 & 64^{\frac{2}{3}} \times 6^{\frac{2}{3}} \\
 & (\sqrt[3]{64})^2 \times 6^{\frac{2}{3}} \\
 & 8^2 \times 6^{\frac{2}{3}} \\
 & 64 \times 6^{\frac{2}{3}} \\
 & 512 \times 6^{\frac{2}{3}}
 \end{aligned}$$

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$$\begin{aligned}
 & (25 \sqrt[3]{x^2})^{\frac{2}{3}} \\
 & (25^1 \times (x^2)^{\frac{2}{3}})^{\frac{2}{3}} \\
 & 25^{\frac{2}{3}} \times x^{\frac{4}{3}} \\
 & \sqrt[3]{25^2} \times x^{\frac{4}{3}} \\
 & 5^{\frac{4}{3}} \times x^{\frac{4}{3}} \rightarrow 125x
 \end{aligned}$$

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