

Practice: What is the value of x to make each true?

$$\sqrt[4]{125^{\frac{2}{3}}} = 5^{\frac{1}{x}}$$

$$\sqrt[3]{3^5} \cdot \sqrt[3]{3^4} = 3^x$$

$$7^{\frac{2}{5}} \cdot 7^{\frac{x}{5}} = 7$$

What is the value of x to make each true?

$$\sqrt[4]{125^{\frac{2}{3}}} = 5^{\frac{1}{x}} \quad \sqrt[4]{\left(\frac{5^3}{3}\right)^{\frac{2}{3}}} = \sqrt[4]{5^2} = 5^{\frac{2}{4}} = 5^{\frac{1}{2}} \quad \boxed{x=2}$$

$$\sqrt[3]{3^5} \cdot \sqrt[3]{3^4} = 3^x \quad 3^{\frac{5}{3}} \cdot 3^{\frac{4}{3}} = 3^{\frac{5+4}{3}} = 3^{\frac{9}{3}} = 3^3 \quad \boxed{x=3}$$

$$7^{\frac{2}{5}} \cdot 7^{\frac{x}{5}} = 7^1 \quad 7^{\frac{2}{5} + \frac{x}{5}} = 7^{\frac{2+x}{5}} \quad \begin{array}{l} 5 \cdot \frac{2+x}{5} = 1 \cdot 5 \\ \cancel{5} \cdot \frac{2+x}{\cancel{5}} = 5 \\ 2+x = 5 \\ -2 \quad -2 \\ \hline x = 3 \end{array} \quad \boxed{x=3}$$