

Are these problems true or false?

①  $\sqrt[3]{25^{\frac{3}{2}}} = 5$     ②  $\frac{27^{\frac{1}{6}}}{\sqrt[6]{27^5}} = \frac{1}{9}$     ③  $X^{\frac{7}{5}} \cdot \sqrt[3]{X} = X^{\frac{15}{5}} \sqrt[3]{X^7}$     ④  $\sqrt[4]{27X^3} \cdot \sqrt[4]{3X^6} = 3X^{\frac{4}{9}}$

# Are these problems true or false?

$$\textcircled{1} \sqrt[3]{25^{\frac{3}{2}}} = 5$$

$$\left(5^2\right)^{\frac{3}{2} \cdot \frac{1}{3}} = 5$$

$$\left(5^3\right)^{\frac{1}{3}} = 5$$

$$5^1 = 5 \checkmark$$

True

$$\textcircled{2} \frac{27^{\frac{1}{6}}}{\sqrt[6]{27^5}} = \frac{1}{9}$$

$$\frac{(3^3)^{\frac{1}{6}}}{(3^3)^{\frac{5}{6}}} = \frac{1}{9}$$

$$\frac{3^{\frac{3}{6}}}{3^{\frac{15}{6}}} = \frac{1}{9}$$

$$3^{\frac{3}{6} - \frac{15}{6}} = \frac{1}{9}$$

$$3^{-\frac{12}{6}} = \frac{1}{9}$$

$$3^{-2} = \frac{1}{9}$$

$$\frac{1}{3^2} = \frac{1}{9} \checkmark$$

TRUE

$$\textcircled{3} X^{\frac{7}{5}} \cdot \sqrt[3]{X} = X^{\sqrt[15]{X^7}}$$

$$X^{\frac{7}{5} \cdot 3} \cdot X^{\frac{1 \cdot 5}{3 \cdot 5}} = X^{\sqrt[15]{X^7}}$$

$$X^{\frac{21}{5}} \cdot X^{\frac{5}{5}} = X^{\sqrt[15]{X^7}}$$

$$X^{\frac{21}{5} + \frac{5}{5}} = X^{\sqrt[15]{X^7}}$$

$$X^{\frac{26}{5}} = X^{\sqrt[15]{X^7}}$$

$$X^{\sqrt[15]{11}} \neq X^{\sqrt[15]{7}}$$

FALSE

$$\textcircled{4} \sqrt[4]{27x^3} \cdot \sqrt[4]{3x^6} = 3x^{\frac{4}{9}}$$

$$\sqrt[4]{81x^9} = 3x^{\frac{4}{9}}$$

$$\sqrt[4]{81} \cdot x^{\frac{9}{4}} = 3x^{\frac{4}{9}}$$

$$3x^{\frac{9}{4}} \neq 3x^{\frac{4}{9}}$$

FALSE