Last Class $\sqrt[b]{x^a} = x^{\frac{a}{b}}$

exponential form $\longleftrightarrow$ radical form

① $x^{5/2} \longrightarrow \sqrt[2]{x^5}$

② $2 \cdot x^{3/8} \longrightarrow 2 \cdot \sqrt[8]{x^3}$

③ $(12x)^{1/2} \longrightarrow \sqrt[2]{(12x)^1}$

④ $(2x)^{1/2} \longleftarrow \sqrt[2]{2x^1}$

⑤ $(2x)^{5/3} \longleftarrow \sqrt[3]{2x^5}$

⑥ $2 \cdot x^{8/4}$

$2x^2$ $\longleftarrow$ $2 \cdot \sqrt[4]{x^8}$

$\sqrt[3]{x^9}$

$\sqrt[3]{xxx\ xxx\ xxx}$

$xxx = x^3$

$\sqrt[7]{x^9}$

$\sqrt[7]{xxxxxxxxx}$

$x\sqrt[7]{xx}$

$x\sqrt[7]{x^2}$

$\sqrt[4]{x^7}$

$\sqrt[4]{xxxxxxx}$

$x\sqrt[4]{x^3}$

$\sqrt[4]{32}$

2 16 8 4 2

$2\sqrt[4]{2}$

① $\sqrt[2]{5x^4}$

$\sqrt[2]{5\,xx\,xx}$

$xx\sqrt[2]{5} = \boxed{x^2\sqrt{5}}$

② $\sqrt[3]{8x^4}$

$8 = 2 \cdot 4 = 2 \cdot 2 \cdot 2$; $\quad xxx\,x$

$\boxed{2x\sqrt[3]{x}}$

③ $\sqrt[3]{16x^6}$

$16 = 2 \cdot 8 = 2 \cdot 2 \cdot 4 = 2 \cdot 2 \cdot 2 \cdot 2$; $\quad xxx\;xxx$

$2xx\sqrt[3]{2}$

$\boxed{2x^2 \cdot \sqrt[3]{2}}$

④ $2 \cdot \sqrt[4]{16x^8}$

$16 = 2 \cdot 8 = 2 \cdot 2 \cdot 4 = 2 \cdot 2 \cdot 2 \cdot 2$; $\quad xxxx\;xxxx$

$2 \cdot 2 \cdot x \cdot x = \boxed{4x^2}$

⑤ $4 \cdot \sqrt[6]{2x^{17}}$

$xxxxxx\;xxxxxx\;xxxxx$

$4 \cdot x \cdot x \cdot \sqrt[6]{2x^5} = \boxed{4x^2 \cdot \sqrt[6]{2x^5}}$

⑥ $\sqrt[3]{27x^9}$

$27 = 3 \cdot 9 = 3 \cdot 3 \cdot 3$; $\quad xxx\;xxx\;xxx$

$3 \cdot x \cdot x \cdot x = \boxed{3x^3}$

⑦ $\sqrt[3]{12x^5}$

$12 = 2 \cdot 6 = 2 \cdot 2 \cdot 3$; $\quad xxx\,xx$

$\boxed{x \cdot \sqrt[3]{12x^2}}$

⑧ $(81x^4)^{2/3}$

$\left(\sqrt[3]{81x^4}\right)^2$

$81 = 3 \cdot 27 = 3 \cdot 3 \cdot 9 = 3 \cdot 3 \cdot 3 \cdot 3$; $\quad xxx\,x$

$\left(3x\sqrt[3]{3x}\right)^2$

$3^2x^2 \cdot \sqrt[3]{3x}^{\,2}$

$\boxed{9x^2 \cdot \sqrt[3]{3x^2}}$