

① P179

$$\begin{aligned}
 (1) & (\sqrt[3]{9} + \sqrt[3]{6} + \sqrt[3]{4})(\sqrt[3]{3} - \sqrt[3]{2}) \\
 &= (\sqrt[3]{3^2} + \sqrt[3]{3 \cdot 2} + \sqrt[3]{2^2})(\sqrt[3]{3} - \sqrt[3]{2}) \\
 &= \{(\sqrt[3]{3})^2 + \sqrt[3]{3} \cdot \sqrt[3]{2} + (\sqrt[3]{2})^2\}(\sqrt[3]{3} - \sqrt[3]{2}) \\
 &= (\sqrt[3]{3})^3 - (\sqrt[3]{2})^3 \\
 &= (3^{\frac{1}{3}})^3 - (2^{\frac{1}{3}})^3 \\
 &= 3^{\frac{1}{3} \times 3} - 2^{\frac{1}{3} \times 3} \\
 &= 3^1 - 2^1 \\
 &= 1 - 2
 \end{aligned}$$

$$(\sqrt[n]{a})^m = \sqrt[n]{a^m}$$

$$\begin{aligned}
 a^3 + b^3 &= (a+b)(a^2 - ab + b^2) \\
 a^3 - b^3 &= (a-b)(a^2 + ab + b^2)
 \end{aligned}$$

$$\begin{aligned}
 (2) & (2^{\frac{1}{2}} + 2^{\frac{3}{4}} \times 3^{\frac{1}{4}} + 3^{\frac{1}{2}})(2^{\frac{1}{2}} - 2^{\frac{3}{4}} \times 3^{\frac{1}{4}} + 3^{\frac{1}{2}}) \\
 &= (2^{\frac{1}{2}} + 3^{\frac{1}{2}} + 2^{\frac{3}{4}} \times 3^{\frac{1}{4}})(2^{\frac{1}{2}} + 3^{\frac{1}{2}} - 2^{\frac{3}{4}} \times 3^{\frac{1}{4}}) \\
 &= \{(2^{\frac{1}{2}} + 3^{\frac{1}{2}}) + 2^{\frac{3}{4}} \times 3^{\frac{1}{4}}\} \{(2^{\frac{1}{2}} + 3^{\frac{1}{2}}) - 2^{\frac{3}{4}} \times 3^{\frac{1}{4}}\} \\
 &= (2^{\frac{1}{2}} + 3^{\frac{1}{2}})^2 - (2^{\frac{3}{4}} \times 3^{\frac{1}{4}})^2 \\
 &= \{(2^{\frac{1}{2}})^2 + 2 \cdot (2^{\frac{1}{2}}) \cdot (3^{\frac{1}{2}}) + (3^{\frac{1}{2}})^2\} - \{(2^{\frac{3}{4}})^2 \times (3^{\frac{1}{4}})^2\} \\
 &= \{2^{\frac{1}{2} \times 2} + 2 \cdot (2 \cdot 3)^{\frac{1}{2}} + 3^{\frac{1}{2} \times 2}\} - \{2^{\frac{3}{4} \times 2} \times 3^{\frac{1}{4} \times 2}\} \\
 &= \{2 + 2 \cdot 6^{\frac{1}{2}} + 3\} - \{2^{\frac{3}{2}} \cdot 3^{\frac{1}{2}}\} \\
 &= 5 + 2 \cdot 6^{\frac{1}{2}} - 2^{\frac{3}{2}} \cdot 3^{\frac{1}{2}} \\
 &= 5 + 2 \cdot 6^{\frac{1}{2}} - (2^3)^{\frac{1}{2}} \cdot 3^{\frac{1}{2}} \\
 &= 5 + 2 \cdot 6^{\frac{1}{2}} - (2^2 \cdot 2)^{\frac{1}{2}} \cdot 3^{\frac{1}{2}} \\
 &= 5 + 2 \cdot 6^{\frac{1}{2}} - (2^2)^{\frac{1}{2}} \cdot 2^{\frac{1}{2}} \cdot 3^{\frac{1}{2}} \\
 &= 5 + 2 \cdot 6^{\frac{1}{2}} - 2^{2 \times \frac{1}{2}} \cdot (2 \cdot 3)^{\frac{1}{2}} \\
 &= 5 + 2 \cdot 6^{\frac{1}{2}} - 2 \cdot 6^{\frac{1}{2}} \\
 &= 5
 \end{aligned}$$

$$(x-y)(x+y) = x^2 - y^2$$

$$\begin{aligned}
 (a^m)^n &= a^{m \times n} \\
 (ab)^m &= a^m \cdot b^m
 \end{aligned}$$