

平方根

① 公式 $\sqrt{a}\sqrt{b} = \sqrt{ab}$ $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$ $\sqrt{a^2} = |a|$
 $\sqrt{(a+b)^2} = |a+b|$

② 近似値

ルニヨルニヨ = ルニミゴロ
 $\sqrt{2} = 1.41421356$

ルニ + ミ = オゴレ + ヤ
 $\sqrt{3} = 1.7320508$

フニシカロクオ - 4 + 7
 $\sqrt{5} = 2.2360679$

ナ = 4ニイ + イ
 $\sqrt{7} = 2.64575$

③ 有理化

$$\frac{1}{\sqrt{a}} \cdot \frac{\sqrt{a}}{\sqrt{a}} = \frac{\sqrt{a}}{a}$$

$$\frac{1}{\sqrt{a} + \sqrt{b}} \cdot \frac{\sqrt{a} - \sqrt{b}}{\sqrt{a} - \sqrt{b}} = \frac{\sqrt{a} - \sqrt{b}}{a - b}$$

$(a+b)(a-b) = a^2 - b^2$

(1) $\frac{4}{3\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{4\sqrt{6}}{3 \times 6} = \frac{2\sqrt{6}}{9}$

(2) $\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} \cdot \frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} + \sqrt{3}} = \frac{(\sqrt{5} + \sqrt{3})^2}{5 - 3} = \frac{5 + 2\sqrt{15} + 3}{2} = \frac{8 + 2\sqrt{15}}{2}$

$$\frac{8 + 2\sqrt{15}}{2} = 4 + \sqrt{15}$$

(3) $\frac{4}{(1 + \sqrt{2}) + \sqrt{3}} \cdot \frac{(1 + \sqrt{2}) - \sqrt{3}}{(1 + \sqrt{2}) - \sqrt{3}} = \frac{4 \{ (1 + \sqrt{2}) - \sqrt{3} \}}{(1 + \sqrt{2})^2 - 3} = \frac{4(1 + \sqrt{2} - \sqrt{3})}{3 + 2\sqrt{2} - 3}$

$$= \frac{4(1 + \sqrt{2} - \sqrt{3})}{2\sqrt{2}} = \frac{2(1 + \sqrt{2} - \sqrt{3})}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2(1 + \sqrt{2} - \sqrt{3}) \times \sqrt{2}}{2}$$

$$= \sqrt{2} + 2 - \sqrt{6}$$

② = 重根号

$$\sqrt{(a+b) \pm 2\sqrt{ab}} = \sqrt{a} \pm \sqrt{b} \quad (a > b)$$

大 小

$$(1) \sqrt{4+2\sqrt{3}} = \sqrt{3} + \sqrt{1} = \underline{\underline{\sqrt{3} + 1}}$$

$$(2) \sqrt{9-2\sqrt{14}} = \underline{\underline{\sqrt{7} - \sqrt{2}}}$$

$$(3) \sqrt{16+6\sqrt{7}} = \sqrt{16+2 \cdot 3\sqrt{7}} = \sqrt{16+2\sqrt{63}}$$
$$= \sqrt{9} + \sqrt{7} = \underline{\underline{3 + \sqrt{7}}}$$

$$(4) \sqrt{5+\sqrt{21}} = \sqrt{5 + \frac{2\sqrt{21}}{2}} = \sqrt{\frac{10+2\sqrt{21}}{2}} = \frac{\sqrt{10+2\sqrt{21}}}{\sqrt{2}}$$
$$= \frac{\sqrt{7} + \sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \underline{\underline{\frac{\sqrt{14} + \sqrt{6}}{2}}}$$