

Racionalización

$$\textcircled{1} \frac{8}{\sqrt{2}}$$

$$\textcircled{2} \frac{m}{\sqrt[3]{m^2}}$$

$$\textcircled{3} \frac{a+b}{\sqrt[3]{(a-b)^2}}$$

La guía de la muerte

$$\textcircled{4} \frac{3x}{\sqrt{a+b}}$$

$$\textcircled{5} \frac{\sqrt[3]{x^2}}{\sqrt[4]{x^7}}$$

$$\textcircled{6} \frac{x}{1+\sqrt{x}} + \frac{2}{\sqrt{x+1}}$$

$$\textcircled{7} \frac{\sqrt{10} - \sqrt{15}}{\sqrt{6}}$$

$$\textcircled{8} \frac{3}{\sqrt[3]{13}}$$

$$\textcircled{9} \frac{5}{\sqrt{7} + \sqrt{3}}$$

$$\textcircled{10} \frac{\sqrt{a}}{\sqrt{a} - \sqrt{c}}$$

$$\textcircled{11} \frac{4a^2}{\sqrt{2a} + 2\sqrt{xy}}$$

$$\textcircled{12} \frac{xy}{\sqrt{x} - \sqrt{y}}$$

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$$\textcircled{13} \frac{6+b}{\sqrt{\sqrt{6}} + \sqrt{8}}$$

$$\textcircled{14} \frac{x+5}{\sqrt{x+1} + \sqrt{2x-3}}$$

$$\textcircled{15} \frac{1+a + \sqrt{1-a^2}}{1+a - \sqrt{1-a^2}}$$

$$\textcircled{16} \frac{\sqrt{3}}{\sqrt{\sqrt{3}} + \sqrt{2}}$$

$$\textcircled{17} \frac{3x\sqrt[3]{x^2}}{\sqrt[5]{x^8}}$$

$$\textcircled{18} \frac{2-x}{\sqrt{x-y} + y-1}$$

$$\textcircled{19} \frac{\sqrt{x} + \sqrt{y}}{\sqrt{\sqrt{x}} + a}$$

$$\textcircled{20} \frac{a-2b}{\sqrt{a} - 2\sqrt{b}}$$

$$\textcircled{21} \frac{1}{\sqrt{z+1} + \sqrt{z-2}}$$

$$\textcircled{22} \frac{\sqrt{\sqrt{3}} - \sqrt{2}}{\sqrt{\sqrt{3}} + \sqrt{2}}$$

$$\textcircled{23} \frac{2b}{\sqrt{a+b} - \sqrt{a-b}}$$

$$\textcircled{24} \frac{\sqrt{\sqrt{x}} - \sqrt{y}}{\sqrt{\sqrt{x}} + \sqrt{y}}$$

$$(25) \frac{a+b}{\sqrt[3]{(a+b)^2}}$$

$$(26) \frac{1}{p-\sqrt{mp}} + \frac{1}{p+\sqrt{mp}}$$

$$(27) \frac{1}{z+\sqrt{x+z^2}} - \frac{\sqrt{x+z^2}}{x}$$

$$(28) \frac{1}{\sqrt{a+\sqrt{b}}} + \frac{\sqrt{ab+\sqrt{b^3}}}{a^2-b}$$

$$(29) \frac{m-n}{\sqrt{a}(\sqrt{m}+\sqrt{n})}$$

$$(30) \frac{1}{\sqrt{\sqrt{z}+\sqrt{w}}}$$

$$(31) \frac{a+b}{\sqrt[3]{\sqrt{a+b}}}$$

$$(32) \frac{a+b}{\sqrt[4]{a+b}}$$

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$$(33) \frac{\sqrt{\sqrt{2}+1}}{\sqrt{\sqrt{2}-1}}$$

$$(34) \frac{\sqrt{5+5}}{\sqrt{\sqrt{5}+1}}$$

$$(35) \frac{a}{\sqrt{a+1}-1}$$

$$(36) \frac{\sqrt{a-1}-\sqrt{a+1}}{\sqrt{a-1}+\sqrt{a+1}}$$

$$(37) \sqrt{\frac{2-\sqrt{2}}{2+\sqrt{2}}}$$

$$(38) \sqrt{\frac{\sqrt{5}+1}{\sqrt{5}-1}}$$

$$(39) \sqrt[3]{\frac{1}{4}} \sqrt[3]{\frac{(\sqrt{3}+1)^2}{\sqrt{3}-1}}$$

$$(40) \sqrt{\frac{1}{2}} \sqrt{\frac{(\sqrt{3}-1)^2}{2+\sqrt{3}}}$$

$$(41) \frac{4(\sqrt{3}-1)}{\frac{3}{2}\sqrt{2}\sqrt{8}-\frac{1}{4}\sqrt{2}\sqrt{6}-\frac{3}{2}\sqrt{3}}$$

$$(42) \sqrt{\frac{(1+\sqrt{3})^3}{3\sqrt{12}-6}}$$

$$\textcircled{1} \quad \frac{8}{\sqrt{2}}$$

$$\frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$\frac{8\sqrt{2}}{\sqrt{2^2}}$$

$$\frac{8\sqrt{2}}{2}$$

$$\boxed{4\sqrt{2}}$$

$$\textcircled{2} \quad \frac{m}{\sqrt[3]{m^2}}$$

$$\frac{m}{\sqrt[3]{m^2}} \cdot \frac{\sqrt[3]{m^1}}{\sqrt[3]{m^1}}$$

$$\frac{m \cdot \sqrt[3]{m}}{\sqrt[3]{m^3}}$$

$$\frac{\cancel{m} \cdot \sqrt[3]{m}}{\cancel{m}}$$

$$\boxed{\sqrt[3]{m}}$$

$$\textcircled{3} \quad \frac{a+b}{\sqrt[3]{(a-b)^2}}$$

$$\frac{a+b}{\sqrt[3]{(a-b)^2}} \cdot \frac{\sqrt[3]{(a-b)}}{\sqrt[3]{(a-b)}}$$

$$\frac{(a+b)\sqrt[3]{(a-b)}}{\sqrt[3]{(a-b)^3}}$$

$$\frac{(a+b)\sqrt[3]{(a-b)}}{(a-b)}$$

$$\textcircled{4} \frac{3x}{\sqrt{a+b}}$$

$$\frac{3x}{\sqrt{a+b}} \cdot \frac{\sqrt{a+b}}{\sqrt{a+b}}$$

$$\frac{3x\sqrt{a+b}}{\sqrt{(a+b)^2}}$$

$$\frac{3x\sqrt{a+b}}{a+b}$$

$$\textcircled{5} \frac{\sqrt[3]{x^2}}{\sqrt[4]{x^7}}$$

$$\frac{\sqrt[3]{x^2}}{\sqrt[4]{x^4 x^3}}$$

$$\frac{\sqrt[3]{x^2}}{\sqrt[4]{x^4} \cdot \sqrt[4]{x^3}}$$

$$\frac{\sqrt[3]{x^2} \cdot \sqrt[4]{x^1}}{x \cdot \sqrt[4]{x^3} \cdot \sqrt[4]{x^1}}$$

$$\frac{\sqrt[12]{(x^2)^4 \cdot (x^1)^3}}{x \sqrt[4]{x^4}}$$

$$\frac{\sqrt[12]{x^{11}}}{x^2}$$

⑥

$$\frac{x}{1 + \sqrt{x}} + \frac{2}{\sqrt{x+1}}$$

$$\frac{x}{1 + \sqrt{x}} \cdot \frac{1 - \sqrt{x}}{1 - \sqrt{x}} + \frac{2}{\sqrt{x+1}} \cdot \frac{\sqrt{x+1}}{\sqrt{x+1}}$$

$$\frac{x(1 - \sqrt{x})}{(1)^2 - (\sqrt{x})^2} + \frac{2\sqrt{x+1}}{\sqrt{(x+1)^2}}$$

$$\frac{x(1 - \sqrt{x})}{1 - x} + \frac{2\sqrt{x+1}}{x+1}$$

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⑦ $\frac{\sqrt{10} - \sqrt{15}}{\sqrt{6}}$

$$\frac{\sqrt{2 \cdot 5} - \sqrt{3 \cdot 5}}{\sqrt{2 \cdot 3}} \quad \left. \vphantom{\frac{\sqrt{2 \cdot 5} - \sqrt{3 \cdot 5}}{\sqrt{2 \cdot 3}}} \right\} \text{No tiene sentido descomponerlo}$$

$$\frac{\sqrt{5}(\sqrt{2} - \sqrt{3})}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}}$$

$$\frac{\sqrt{5}(\sqrt{6 \cdot 2} - \sqrt{6 \cdot 3})}{\sqrt{6^2}}$$

$$\begin{aligned} & \downarrow \\ & \frac{\sqrt{5} \cdot (\sqrt{2 \cdot 3 \cdot 2} - \sqrt{2 \cdot 3 \cdot 3})}{6} \\ & \frac{\sqrt{5} (\sqrt{2^2} \cdot \sqrt{3} - \sqrt{3^2} \sqrt{2})}{6} \\ & \frac{\sqrt{5} (2\sqrt{3} - 3\sqrt{2})}{6} \end{aligned}$$

$$\textcircled{8} \quad \frac{3}{\sqrt[3]{13}}$$

$$\frac{3}{\sqrt[3]{13}} \cdot \frac{\sqrt[3]{(13)^2}}{\sqrt[3]{(13)^2}}$$

$$\frac{3 \sqrt[3]{(13)^2}}{\sqrt[3]{(13)^3}}$$

$$\boxed{\frac{3 \sqrt[3]{(13)^2}}{13}}$$

$$\textcircled{9} \quad \frac{5}{\sqrt{7} + \sqrt{3}}$$

$$\frac{5}{(\sqrt{7} + \sqrt{3})} \cdot \frac{(\sqrt{7} - \sqrt{3})}{(\sqrt{7} - \sqrt{3})}$$

$$\frac{5(\sqrt{7} - \sqrt{3})}{(\sqrt{7})^2 - (\sqrt{3})^2}$$

$$\frac{5(\sqrt{7} - \sqrt{3})}{4 \text{ (Solo queda el 4)}}$$

$$\frac{5(\sqrt{7} - \sqrt{3})}{4}$$

$$\textcircled{10} \frac{\sqrt{a}}{\sqrt{a} - \sqrt{c}}$$

$$\frac{\sqrt{a}}{(\sqrt{a} - \sqrt{c})} \frac{(\sqrt{a} + \sqrt{c})}{(\sqrt{a} + \sqrt{c})}$$

$$\frac{\cancel{\sqrt{a^2}} + \sqrt{ac}}{\sqrt{a^2} - \sqrt{c^2}}$$

$$\boxed{\frac{a + \sqrt{ac}}{a - c}}$$

$$\textcircled{12} \frac{xy}{\sqrt{x} - \sqrt{y}}$$

$$\frac{xy(\sqrt{x} + \sqrt{y})}{(\sqrt{x} - \sqrt{y})(\sqrt{x} + \sqrt{y})}$$

$$\frac{\cancel{xy}(\sqrt{x} + \sqrt{y})}{\sqrt{(x)^2} - \sqrt{(y)^2}}$$

$$\boxed{\frac{xy(\sqrt{x} + \sqrt{y})}{x - y}}$$

$$\textcircled{11} \frac{4a^2}{\sqrt{2n} + 2\sqrt{xy}}$$

$$\frac{4a^2(\sqrt{2n} - 2\sqrt{xy})}{(\sqrt{2n} + 2\sqrt{xy})(\sqrt{2n} - 2\sqrt{xy})}$$

$$\frac{4a^2(\sqrt{2n} - 2\sqrt{xy})}{\sqrt{(2n)^2} - (2\sqrt{xy})^2}$$

$$\frac{4a^2(\sqrt{2n} - 2\sqrt{xy})}{\sqrt{(2n)^2} - (2)^2 \sqrt{(xy)^2}}$$

$$\frac{4a^2(\sqrt{2n} - 2\sqrt{xy})}{2n - 4xy}$$

$$\frac{2 \cancel{4} a^2(\sqrt{2n} - 2\sqrt{xy})}{\cancel{1} \cancel{2} (n - 2xy)}$$

$$\boxed{\frac{2a^2(\sqrt{2n} - 2\sqrt{xy})}{n - 2xy}}$$

$$\textcircled{13} \quad \frac{6+8}{\sqrt{\sqrt{6} + \sqrt{8}}}$$

$$\frac{14}{\sqrt{\sqrt{6} + \sqrt{8}}} \cdot \frac{\sqrt{\sqrt{6} + \sqrt{8}}}{\sqrt{\sqrt{6} + \sqrt{8}}}$$

$$\frac{14 \sqrt{\sqrt{6} + \sqrt{8}}}{\sqrt{(\sqrt{6} + \sqrt{8})^2}}$$

$$\frac{14 \sqrt{\sqrt{6} + \sqrt{8}}}{\sqrt{6} + \sqrt{8}} \cdot \frac{\sqrt{6} - \sqrt{8}}{\sqrt{6} - \sqrt{8}}$$

$$\frac{14 (\sqrt{\sqrt{6} + \sqrt{8}}) (\sqrt{6} - \sqrt{8})}{\sqrt{(6)^2} - \sqrt{(8)^2}}$$

$$\frac{14 (\sqrt{\sqrt{6} + \sqrt{8}}) (\sqrt{6} - \sqrt{8})}{6-8}$$

$$\frac{7 \cdot 14 (\sqrt{\sqrt{6} + \sqrt{8}}) (\sqrt{6} - \sqrt{8})}{-2}$$

$$\boxed{-7 (\sqrt{\sqrt{6} + \sqrt{8}}) (\sqrt{6} - \sqrt{8})}$$

14

$$\frac{x+5}{\sqrt{x+1} + \sqrt{2x-3}}$$

$$\frac{x+5}{\sqrt{x+1} + \sqrt{2x-3}} \cdot \frac{\sqrt{x+1} - \sqrt{2x-3}}{\sqrt{x+1} - \sqrt{2x-3}}$$

$$\frac{(x+5)(\sqrt{x+1} - \sqrt{2x-3})}{\sqrt{(x+1)^2} - \sqrt{(2x-3)^2}}$$

$$\frac{(x+5)(\sqrt{x+1} - \sqrt{2x-3})}{x+1 - (2x-3)}$$

$$\frac{(x+5)(\sqrt{x+1} - \sqrt{2x-3})}{x+1 - 2x+3}$$

$$\frac{(x+5)(\sqrt{x+1} - \sqrt{2x-3})}{-x+4}$$

$$\textcircled{15} \frac{1+a+\sqrt{1-a^2}}{1+a-\sqrt{1-a^2}}$$

$$\frac{\left((1+a)+\sqrt{1-a^2}\right)\left((1+a)+\sqrt{1-a^2}\right)}{\left((1+a)-\sqrt{1-a^2}\right)\left((1+a)+\sqrt{1-a^2}\right)}$$

$$\frac{\left((1+a)+\sqrt{1-a^2}\right)^2}{(1+a)^2 - \cancel{\sqrt{(1-a^2)^2}}}$$

$$\frac{\left((1+a)+\sqrt{1-a^2}\right)^2}{1+2a+a^2 - 1+a^2}$$

$$\frac{\left((1+a)+\sqrt{1-a^2}\right)^2}{2a+2a^2}$$

$$\frac{(1+a)^2 + 2(1+a)\sqrt{1-a^2} + \cancel{\sqrt{(1-a^2)^2}}}{2a(1+a)}$$

$$\frac{1+2a+\cancel{a^2} + 2(1+a)\sqrt{1-a^2} + 1-\cancel{a^2}}{2a(1+a)}$$

$$\frac{2+2a+2(1+a)\sqrt{1-a^2}}{2a(1+a)}$$

$$\frac{2(1+a)+2(1+a)\sqrt{1-a^2}}{2a(1+a)}$$

$$\frac{\sqrt{2(1+a)[1+\sqrt{1-a^2}]}}{2a(1+a)}$$

$$\frac{1+\sqrt{1-a^2}}{a}$$

$$\textcircled{16} \quad \frac{\sqrt{3}}{\sqrt{\sqrt{3} + \sqrt{2}}}$$

$$\frac{\sqrt{3}(\sqrt{\sqrt{3} + \sqrt{2}})}{\sqrt{\sqrt{3} + \sqrt{2}} \cdot \sqrt{\sqrt{3} + \sqrt{2}}}$$

$$\frac{\sqrt{3}(\sqrt{\sqrt{3} + \sqrt{2}})}{\sqrt{(\sqrt{3} + \sqrt{2})^2}}$$

$$\frac{\sqrt{3}(\sqrt{\sqrt{3} + \sqrt{2}})}{\sqrt{3} + \sqrt{2}} \cdot \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}}$$

$$\frac{\sqrt{3}(\sqrt{\sqrt{3} + \sqrt{2}})(\sqrt{3} - \sqrt{2})}{\sqrt{(\sqrt{3})^2 - (\sqrt{2})^2}}$$

$$\boxed{\sqrt{3}(\sqrt{\sqrt{3} + \sqrt{2}})(\sqrt{3} - \sqrt{2})}$$

$$\sqrt{\sqrt{3} + \sqrt{2}} \cdot (\sqrt{(\sqrt{3})^2 - (\sqrt{2})^2})$$

$$\boxed{(3 - \sqrt{6})(\sqrt{\sqrt{3} + \sqrt{2}})}$$

17

$$\frac{3x \sqrt[3]{x^2}}{\sqrt[5]{x^8}}$$

$$\frac{3x \sqrt[3]{x^2}}{\sqrt[5]{x^5 \cdot x^3}}$$

$$\frac{3x \sqrt[3]{x^2}}{\sqrt[5]{x^5} \sqrt[5]{x^3}}$$

$$\frac{3x \sqrt[3]{x^2}}{x \cdot \sqrt[5]{x^3}}$$

$$\frac{3 \sqrt[3]{x^2}}{\sqrt[5]{x^3}} \cdot \frac{\sqrt[5]{x^2}}{\sqrt[5]{x^2}}$$

$$\frac{3 \sqrt[15]{(x^2)^5 \cdot (x^2)^3}}{\sqrt[5]{x^3 \cdot x^2}}$$

$$\frac{3 \sqrt[15]{x^{10} \cdot x^6}}{\sqrt[5]{x^5}}$$

$$\frac{3 \sqrt[15]{x^{15} \cdot x^1}}{x}$$

↓

$$\frac{3 \sqrt[15]{x^{15}} \cdot \sqrt[15]{x}}{x}$$
$$\frac{3x \sqrt[15]{x}}{x}$$
$$\boxed{3 \sqrt[15]{x}}$$

$$\textcircled{18} \quad \frac{2-x}{\sqrt{x-y} + y-1}$$

$$\frac{(2-x)(\sqrt{x-y} - (y-1))}{(\sqrt{x-y})^2 - (y-1)^2}$$

$$\frac{(2-x)(\sqrt{x-y} - (y-1))}{(x-y) - (y^2 + 2 \cdot y \cdot (-1) + (-1)^2)}$$

$$\frac{(2-x)(\sqrt{x-y} - (y-1))}{x-y - (y^2 - 2y + 1)}$$

$$\frac{(2-x)(\sqrt{x-y} - (y-1))}{x-y-y^2+2y+1}$$

$\frac{(2-x)(\sqrt{x-y} - (y-1))}{x-y^2+y+1}$

$$\textcircled{19} \frac{\sqrt{x} + \sqrt{y}}{\sqrt{\sqrt{x} + a}}$$

$$\frac{\sqrt{x} + \sqrt{y}}{\sqrt{\sqrt{x} + a}} \cdot \frac{\sqrt{\sqrt{x} + a}}{\sqrt{\sqrt{x} + a}}$$

$$\frac{(\sqrt{x} + \sqrt{y}) \sqrt{\sqrt{x} + a}}{\sqrt{(\sqrt{x} + a)^2}}$$

$$\frac{(\sqrt{x} + \sqrt{y}) \sqrt{\sqrt{x} + a}}{\sqrt{x} + a}$$

$$\frac{(\sqrt{x} + \sqrt{y}) \sqrt{\sqrt{x} + a}}{\sqrt{x} + a} \cdot \frac{\sqrt{x} - a}{\sqrt{x} - a}$$

$$\frac{(\sqrt{x} + \sqrt{y}) (\sqrt{\sqrt{x} + a}) (\sqrt{x} - a)}{\sqrt{x}^2 - a^2}$$

$$\boxed{\frac{(\sqrt{x} + \sqrt{y}) (\sqrt{\sqrt{x} + a}) (\sqrt{x} - a)}{x - a^2}}$$

$$\textcircled{20} \frac{a-2b}{\sqrt{\sqrt{a}-2\sqrt{b}}}$$

$$\frac{a-2b}{\sqrt{\sqrt{a}-2\sqrt{b}}} \cdot \frac{\sqrt{\sqrt{a}-2\sqrt{b}}}{\sqrt{\sqrt{a}-2\sqrt{b}}}$$

$$\frac{(a-2b) \sqrt{\sqrt{a}-2\sqrt{b}}}{\sqrt{(\sqrt{a}-2\sqrt{b})^2}}$$

$$\frac{(a-2b) \sqrt{\sqrt{a}-2\sqrt{b}}}{\sqrt{a}-2\sqrt{b}}$$

$$\frac{(a-2b)(\sqrt{\sqrt{a}-2\sqrt{b}})}{\sqrt{a}-2\sqrt{b}} \cdot \frac{\sqrt{a}+2\sqrt{b}}{\sqrt{a}+2\sqrt{b}}$$

$$\frac{(a-2b) \sqrt{\sqrt{a}-2\sqrt{b}} (\sqrt{a}+2\sqrt{b})}{(\sqrt{a})^2 - (2\sqrt{b})^2}$$

$$\frac{(a-2b) \sqrt{\sqrt{a}-2\sqrt{b}} (\sqrt{a}+2\sqrt{b})}{a-4b}$$

21

$$\frac{1}{\sqrt{z+1} + \sqrt{z-2}}$$

$$\frac{1}{\sqrt{z+1} + \sqrt{z-2}} \cdot \frac{\sqrt{z+1} - \sqrt{z-2}}{\sqrt{z+1} - \sqrt{z-2}}$$

$$\frac{\sqrt{z+1} - \sqrt{z-2}}{(\sqrt{z+1})^2 - (\sqrt{z-2})^2}$$

$$\frac{\sqrt{z+1} - \sqrt{z-2}}{z+1 - z+2}$$

$$\boxed{\frac{\sqrt{z+1} - \sqrt{z-2}}{+3}}$$

$$\textcircled{22} \quad \frac{\sqrt{\sqrt{3}-\sqrt{2}}}{\sqrt{\sqrt{3}+\sqrt{2}}}$$

$$\frac{\sqrt{\sqrt{3}-\sqrt{2}}}{\sqrt{\sqrt{3}+\sqrt{2}}} \cdot \frac{\sqrt{\sqrt{3}+\sqrt{2}}}{\sqrt{\sqrt{3}+\sqrt{2}}}$$

$$\frac{\sqrt{(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2})}}{\sqrt{(\sqrt{3}+\sqrt{2})^2}}$$

$$\frac{\sqrt{\sqrt{3}^2 - \sqrt{2}^2}}{\sqrt{3} + \sqrt{2}}$$

$$\frac{\sqrt{3-2}}{\sqrt{3} + \sqrt{2}}$$

$$\frac{\sqrt{1}}{\sqrt{3} + \sqrt{2}} \cdot \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}}$$

$$\frac{\sqrt{3} - \sqrt{2}}{\sqrt{3}^2 - \sqrt{2}^2}$$

$$\frac{\sqrt{3} - \sqrt{2}}{3-2}$$

$$\boxed{\sqrt{3} - \sqrt{2}}$$

$$(23) \quad \frac{2b}{\sqrt{a+b} - \sqrt{a-b}}$$

$$\frac{2b}{\sqrt{a+b} - \sqrt{a-b}} \cdot \frac{\sqrt{a+b} + \sqrt{a-b}}{\sqrt{a+b} + \sqrt{a-b}}$$

$$\frac{2b(\sqrt{a+b} + \sqrt{a-b})}{\sqrt{(a+b)^2} - \sqrt{(a-b)^2}}$$

$$\frac{2b(\sqrt{a+b} + \sqrt{a-b})}{a+b-a+b}$$

$$\frac{2b(\sqrt{a+b} + \sqrt{a-b})}{2b}$$

$$\boxed{\sqrt{a+b} + \sqrt{a-b}}$$

(24)

$$\frac{\sqrt{\sqrt{x} - \sqrt{y}}}{\sqrt{\sqrt{x} + \sqrt{y}}}$$

$$\frac{\sqrt{\sqrt{x} - \sqrt{y}}}{\sqrt{\sqrt{x} + \sqrt{y}}} \cdot \frac{\sqrt{\sqrt{x} + \sqrt{y}}}{\sqrt{\sqrt{x} + \sqrt{y}}}$$

$$\frac{\sqrt{(\sqrt{x} - \sqrt{y})(\sqrt{x} + \sqrt{y})}}{\sqrt{(\sqrt{x} + \sqrt{y})^2}}$$

$$\frac{\sqrt{\cancel{\sqrt{x}}^2 - \cancel{\sqrt{y}}^2}}{\sqrt{x} + \sqrt{y}}$$

$$\frac{\sqrt{x-y}}{\sqrt{x} + \sqrt{y}} \cdot \frac{\sqrt{x} - \sqrt{y}}{\sqrt{x} - \sqrt{y}}$$

$$\frac{\sqrt{x-y} \cdot (\sqrt{x} - \sqrt{y})}{\cancel{\sqrt{x}}^2 - \cancel{\sqrt{y}}^2}$$

$$\frac{\sqrt{x-y} (\sqrt{x} - \sqrt{y})}{x-y}$$

$$(25) \frac{a+b}{\sqrt[3]{(a+b)^2}}$$

$$\frac{a+b}{\sqrt[3]{(a+b)^2}} \cdot \frac{\sqrt[3]{a+b}}{\sqrt[3]{a+b}}$$

$$\frac{a+b \sqrt[3]{a+b}}{\sqrt[3]{(a+b)^3}}$$

$$\frac{(a+b) \sqrt[3]{a+b}}{(a+b)}$$

$$\sqrt[3]{a+b}$$

$$(26) \frac{1}{p-\sqrt{mp}} + \frac{1}{p+\sqrt{mp}}$$

$$\frac{1}{p-\sqrt{mp}} \cdot \frac{p+\sqrt{mp}}{p+\sqrt{mp}} + \frac{1}{p+\sqrt{mp}} \cdot \frac{p-\sqrt{mp}}{p-\sqrt{mp}}$$

$$\frac{p+\sqrt{mp}}{p^2-\sqrt{(mp)^2}} + \frac{p-\sqrt{mp}}{p^2-\sqrt{(mp)^2}}$$

$$\frac{p+\sqrt{mp}}{p^2-mp} + \frac{p-\sqrt{mp}}{p^2-mp}$$

$$\frac{p+\sqrt{mp}+p-\sqrt{mp}}{p^2-mp}$$

$$\frac{2p}{p(p-m)}$$

$$\boxed{\frac{2}{p-m}}$$

$$(27) \quad \frac{1}{z + \sqrt{x+z^2}} - \frac{\sqrt{x+z^2}}{x}$$

$$\frac{1}{z + \sqrt{x+z^2}} \cdot \frac{z - \sqrt{x+z^2}}{z - \sqrt{x+z^2}} - \frac{\sqrt{x+z^2}}{x}$$

$$\frac{z - \sqrt{x+z^2}}{z^2 - \sqrt{(x+z^2)^2}} - \frac{\sqrt{x+z^2}}{x}$$

$$\frac{z - \sqrt{x+z^2}}{z^2 - (x+z^2)} - \frac{\sqrt{x+z^2}}{x}$$

$$\frac{z - \sqrt{x+z^2}}{z^2 - x - z^2} - \frac{\sqrt{x+z^2}}{x}$$

$$\frac{z - \sqrt{x+z^2}}{-x} - \frac{\sqrt{x+z^2}}{x}$$

$$\frac{-z + \sqrt{x+z^2}}{x} - \frac{\sqrt{x+z^2}}{x}$$

$$\frac{-z + \sqrt{x+z^2} - \sqrt{x+z^2}}{x}$$

$$\boxed{-\frac{z}{x}}$$

$$(28) \quad \frac{1}{\sqrt{a+\sqrt{b}}} + \frac{\sqrt{ab+\sqrt{b^3}}}{a^2-b}$$

$$\frac{1}{\sqrt{a+\sqrt{b}}} \cdot \frac{\sqrt{a+\sqrt{b}}}{\sqrt{a+\sqrt{b}}} + \frac{\sqrt{ab+\sqrt{b^3}}}{a^2-b}$$

$$\frac{\sqrt{a+\sqrt{b}}}{\sqrt{(a+\sqrt{b})^2}} + \frac{\sqrt{ab+\sqrt{b^3}}}{a^2-b}$$

$$\frac{\sqrt{a+\sqrt{b}}}{a+\sqrt{b}} + \frac{\sqrt{ab+b\sqrt{b}}}{a^2-b}$$

$$\frac{\sqrt{a+\sqrt{b}}}{a+\sqrt{b}} \cdot \frac{a-\sqrt{b}}{a-\sqrt{b}} + \frac{\sqrt{b(a+\sqrt{b})}}{a^2-b}$$

$$\frac{(\sqrt{a+\sqrt{b}})(a-\sqrt{b})}{a^2-\sqrt{b}^2} + \frac{\sqrt{b}\sqrt{a+\sqrt{b}}}{a^2-b}$$

$$\frac{(\sqrt{a+\sqrt{b}})(a-\sqrt{b}) + \sqrt{b}\sqrt{a+\sqrt{b}}}{a^2-b}$$

$$\frac{a\sqrt{a+\sqrt{b}} - \sqrt{b}\sqrt{a+\sqrt{b}} + \sqrt{b}\sqrt{a+\sqrt{b}}}{a^2-b} \rightarrow$$

$$\boxed{\frac{a\sqrt{a+\sqrt{b}}}{a^2-b}}$$

(29)

$$\frac{m-n}{\sqrt{a}(\sqrt{m}+\sqrt{n})}$$

$$\frac{(m-n)\sqrt{a}}{\sqrt{a}(\sqrt{m}+\sqrt{n})\sqrt{a}}$$

$$\frac{(m-n)\sqrt{a}}{\sqrt{a}^2(\sqrt{m}+\sqrt{n})}$$

$$\frac{(m-n)\sqrt{a}}{a(\sqrt{m}+\sqrt{n})}$$

$$\frac{(m-n)\sqrt{a}(\sqrt{m}-\sqrt{n})}{a(\sqrt{m}+\sqrt{n})(\sqrt{m}-\sqrt{n})}$$

$$\frac{(m-n)\sqrt{a}(\sqrt{m}-\sqrt{n})}{a(\sqrt{m}^2-\sqrt{n}^2)}$$

$$\frac{\cancel{(m-n)}\sqrt{a}(\sqrt{m}-\sqrt{n})}{a\cancel{(m-n)}}$$

$$\frac{\sqrt{a}(\sqrt{m}-\sqrt{n})}{a}$$

$$\textcircled{30} \frac{1}{\sqrt{\sqrt{z} + \sqrt{w}}}$$

$$\frac{1}{\sqrt{\sqrt{z} + \sqrt{w}}} \cdot \frac{\sqrt{\sqrt{z} + \sqrt{w}}}{\sqrt{\sqrt{z} + \sqrt{w}}}$$

$$\frac{\sqrt{\sqrt{z} + \sqrt{w}}}{\sqrt{(\sqrt{z} + \sqrt{w})^2}}$$

$$\frac{\sqrt{\sqrt{z} + \sqrt{w}}}{\sqrt{z} + \sqrt{w}}$$

$$\frac{\sqrt{\sqrt{z} + \sqrt{w}}}{\sqrt{z} + \sqrt{w}} \cdot \frac{\sqrt{z} - \sqrt{w}}{\sqrt{z} - \sqrt{w}}$$

$$\frac{\sqrt{\sqrt{z} + \sqrt{w}} \cdot (\sqrt{z} - \sqrt{w})}{\sqrt{(z)^2} - \sqrt{(w)^2}}$$

$$\frac{\sqrt{\sqrt{z} + \sqrt{w}} (\sqrt{z} - \sqrt{w})}{z - w}$$

(31)
$$\frac{a+b}{\sqrt[3]{\sqrt{a+b}}}$$

$$\frac{a+b}{\sqrt[3 \times 2]{a+b}}$$

$$\frac{a+b}{\sqrt[6]{a+b}}$$

$$\frac{a+b}{\sqrt[6]{a+b}} \cdot \frac{\sqrt[6]{(a+b)^5}}{\sqrt[6]{(a+b)^5}}$$

$$\frac{(a+b) \sqrt[6]{(a+b)^5}}{\sqrt[6]{(a+b)^6}}$$

$$\sqrt[6]{(a+b)^5}$$

32

$$\frac{a+b}{\sqrt[4]{(a+b)}}$$

$$\frac{a+b}{\sqrt[4]{(a+b)}}$$

$$\frac{\sqrt[4]{(a+b)^3}}{\sqrt[4]{(a+b)^3}}$$

$$\frac{(\cancel{a+b}) \sqrt[4]{(a+b)^3}}{\sqrt[4]{(\cancel{a+b})^4}}$$

$$\sqrt[4]{(a+b)^3}$$

33

$$\frac{\sqrt{\sqrt{2}+1}}{\sqrt{\sqrt{2}-1}}$$

$$\frac{\sqrt{\sqrt{2}+1}}{\sqrt{\sqrt{2}-1}} \cdot \frac{\sqrt{\sqrt{2}-1}}{\sqrt{\sqrt{2}-1}}$$

$$\frac{\sqrt{(\sqrt{2}+1)(\sqrt{2}-1)}}{\sqrt{(\sqrt{2}-1)^2}}$$

$$\frac{\sqrt{(\sqrt{2})^2 - 1^2}}{\sqrt{2} - 1}$$

$$\frac{\sqrt{2-1}}{\sqrt{2}-1}$$

$$\frac{\sqrt{1}}{\sqrt{2}-1} \cdot \frac{\sqrt{2}+1}{\sqrt{2}+1}$$

$$\frac{\sqrt{2}+1}{(\sqrt{2})^2 - (1)^2}$$

$$\frac{\sqrt{2}+1}{1}$$

$$\boxed{\sqrt{2}+1}$$

$$\textcircled{34} \quad \frac{\sqrt{5} + 5}{\sqrt{\sqrt{5} + 1}}$$

$$\frac{(\sqrt{5} + 5) \sqrt{\sqrt{5} + 1}}{\sqrt{\sqrt{5} + 1} \cdot \sqrt{\sqrt{5} + 1}}$$

$$\frac{(\sqrt{5} + 5) \sqrt{\sqrt{5} + 1}}{\sqrt{(\sqrt{5} + 1)^2}}$$

$$\frac{(\sqrt{5} + 5) \sqrt{\sqrt{5} + 1}}{\sqrt{5} + 1}$$

$$\frac{(\sqrt{5} + 5) \sqrt{\sqrt{5} + 1}}{\sqrt{5} + 1} \cdot \frac{\sqrt{5} - 1}{\sqrt{5} - 1}$$

$$\frac{(\sqrt{5} + 5)(\sqrt{5} - 1) \sqrt{\sqrt{5} + 1}}{\sqrt{5}^2 - 1^2}$$

$$\frac{(\sqrt{5}\sqrt{5} - \sqrt{5} + 5\sqrt{5} - 5) \sqrt{\sqrt{5} + 1}}{5 - 1}$$

$$\frac{(\cancel{\sqrt{5}}^4 + 4\sqrt{5} - \cancel{5}) \sqrt{\sqrt{5} + 1}}{4}$$

$$\frac{4\sqrt{5} (\sqrt{\sqrt{5} + 1})}{4} \longrightarrow \boxed{\sqrt{5} \sqrt{\sqrt{5} + 1}}$$

35

$$\frac{a}{\sqrt{a+1} - 1}$$

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

$$\frac{a(\sqrt{a+1} + 1)}{\sqrt{(a+1)^2} - (1)^2}$$

$$\frac{a(\sqrt{a+1} + 1)}{a + 1 - 1}$$

$$\frac{a(\sqrt{a+1} + 1)}{a}$$

$$\boxed{\sqrt{a+1} + 1}$$

36

$$\frac{\sqrt{a-1} - \sqrt{a+1}}{\sqrt{a-1} + \sqrt{a+1}}$$

$$\frac{(\sqrt{a-1} - \sqrt{a+1})(\sqrt{a-1} - \sqrt{a+1})}{(\sqrt{a-1} + \sqrt{a+1})(\sqrt{a-1} - \sqrt{a+1})}$$

$$\frac{(\sqrt{a-1} - \sqrt{a+1})^2}{\sqrt{(a-1)^2} - \sqrt{(a+1)^2}}$$

$$\frac{\sqrt{(a-1)^2} - 2\sqrt{(a-1)}\sqrt{a+1} + \sqrt{(a+1)^2}}{a-1 - a-1}$$

$$\frac{a-1 - 2\sqrt{(a-1)(a+1)} + a+1}{-2}$$

$$\frac{2a - 2\sqrt{a^2-1}}{-2}$$

$$\frac{2(a - \sqrt{a^2-1})}{-2}$$

$$\frac{a - \sqrt{a^2-1}}{-1}$$

$$\boxed{\sqrt{a^2-1} - a}$$

37

$$\sqrt{\frac{2-\sqrt{2}}{2+\sqrt{2}}}$$

$$\frac{\sqrt{2-\sqrt{2}}}{\sqrt{2+\sqrt{2}}} \cdot \frac{\sqrt{2+\sqrt{2}}}{\sqrt{2+\sqrt{2}}}$$

$$\frac{\sqrt{(2+\sqrt{2})(2-\sqrt{2})}}{\sqrt{(2+\sqrt{2})^2}}$$

$$\frac{\sqrt{(2)^2 - (\sqrt{2})^2}}{2+\sqrt{2}}$$

$$\frac{\sqrt{4-2}}{2+\sqrt{2}}$$

$$\frac{\sqrt{2}}{2+\sqrt{2}} \cdot \frac{2-\sqrt{2}}{2-\sqrt{2}}$$

$$\frac{\sqrt{2}(2-\sqrt{2})}{(2)^2 - (\sqrt{2})^2}$$

$$\frac{2\sqrt{2} - \sqrt{2}^2}{4-2}$$

$$\begin{aligned} &\downarrow \\ &\frac{2\sqrt{2} - 2}{2} \\ &\frac{2(\sqrt{2} - 1)}{2} \\ &\boxed{\sqrt{2} - 1} \end{aligned}$$

38

$$\sqrt{\frac{\sqrt{5}+1}{\sqrt{5}-1}}$$

$$\frac{\sqrt{\sqrt{5}+1}}{\sqrt{\sqrt{5}-1}} \cdot \frac{\sqrt{\sqrt{5}-1}}{\sqrt{\sqrt{5}-1}}$$

$$\frac{\sqrt{(\sqrt{5}+1)(\sqrt{5}-1)}}{\sqrt{(\sqrt{5}-1)^2}}$$

$$\frac{\sqrt{(\sqrt{5}+1)(\sqrt{5}-1)}}{\sqrt{5}-1}$$

$$\frac{\sqrt{(\sqrt{5})^2 - 1^2}}{\sqrt{5}-1} \cdot \frac{\sqrt{5}+1}{\sqrt{5}+1}$$

$$\frac{\sqrt{4} \cdot (\sqrt{5}+1)}{\sqrt{5}^2 - 1^2}$$

$$\frac{2(\sqrt{5}+1)}{4}$$

$$= \boxed{\frac{\sqrt{5}+1}{2}}$$

(39)

$$\sqrt[3]{\frac{1}{4}} \sqrt[3]{\frac{(\sqrt{3}+1)^2}{\sqrt{3}-1}}$$

$$\frac{\sqrt[3]{1}}{\sqrt[3]{2^2}} \cdot \frac{\sqrt[3]{(\sqrt{3}+1)^2}}{\sqrt[3]{\sqrt{3}-1}}$$

$$\frac{1 \cdot \sqrt[3]{2^1}}{\sqrt[3]{2^2} \cdot \sqrt[3]{2}} \cdot \frac{\sqrt[3]{(\sqrt{3}+1)^2}}{\sqrt[3]{\sqrt{3}+1}}$$

$$\frac{\sqrt[3]{2}}{\cancel{\sqrt[3]{2^3}}} \cdot \frac{\sqrt[3]{(\sqrt{3}+1)^2}}{\sqrt[3]{\sqrt{3}-1}}$$

$$\frac{\sqrt[3]{2}}{2} \cdot \frac{\sqrt[3]{(\sqrt{3}+1)(\sqrt{3}+1)}}{\sqrt[3]{\sqrt{3}-1}}$$

$$\frac{\sqrt[3]{2}}{2} \cdot \frac{\sqrt[3]{(\sqrt{3}+1)(\sqrt{3}+1)}}{\sqrt[3]{(\sqrt{3}-1)}} \cdot \frac{\sqrt[3]{(\sqrt{3}-1)^2}}{\sqrt[3]{(\sqrt{3}-1)^2}}$$

$$\frac{\sqrt[3]{2}}{2} \cdot \frac{\sqrt[3]{(\sqrt{3}+1)(\sqrt{3}+1)(\sqrt{3}-1)(\sqrt{3}-1)}}{\cancel{\sqrt[3]{(\sqrt{3}-1)^3}}}$$

$$\frac{\sqrt[3]{2}}{2} \cdot \frac{\sqrt[3]{(\sqrt{3}+1)(\sqrt{3}-1)(\sqrt{3}+1)(\sqrt{3}-1)}}{\sqrt{3}-1}$$

$$\frac{\sqrt[3]{2}}{2} \cdot \frac{\sqrt[3]{((\sqrt{3})^2-1^2)(\sqrt{3}^2-1^2)}}{\sqrt{3}-1}$$

$$\frac{\sqrt[3]{2}}{2} \cdot \frac{\sqrt[3]{(3-1)(3-1)}}{\sqrt{3}-1}$$

$$\frac{\sqrt[3]{2}}{2} \cdot \frac{\sqrt[3]{2 \cdot 2}}{(\sqrt{3}-1)} \cdot \frac{\sqrt{3}+1}{\sqrt{3}+1}$$

$$\frac{\sqrt[3]{2^3}}{2} \cdot \frac{\sqrt{3}+1}{(\sqrt{3}-1)^2}$$

$$\frac{2}{2} \cdot \frac{\sqrt{3}+1}{3-1}$$

$$\boxed{\frac{\sqrt{3}+1}{2}}$$

$$\textcircled{40} \quad \sqrt{\frac{1}{2}} \sqrt{\frac{(\sqrt{3}-1)^2}{2+\sqrt{3}}}$$

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

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

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

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

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

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

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

$$\frac{\sqrt{4+2\sqrt{3}}}{2(4-3)} \cdot (2\sqrt{3} - 3 - 2 + \sqrt{3}) \rightarrow \frac{\sqrt{4+2\sqrt{3}} \cdot (3\sqrt{3}-5)}{2}$$

41

$$4(\sqrt{3}-1)$$

$$\frac{3}{2}\sqrt{2}\sqrt{8} - \frac{1}{4}\sqrt{2}\sqrt{6} - \frac{3}{2}\sqrt{3}$$

$$4(\sqrt{3}-1)$$

$$\frac{3}{2}\sqrt{2}\cdot\sqrt{2^3} - \frac{1}{4}\sqrt{2}\sqrt{2\cdot 3} - \frac{3}{2}\sqrt{3}$$

$$4(\sqrt{3}-1)$$

$$\frac{3}{2}\sqrt{2\cdot 2^3} - \frac{1}{4}\sqrt{2\cdot 2}\sqrt{3} - \frac{3}{2}\sqrt{3}$$

$$4(\sqrt{3}-1)$$

$$\frac{3}{2}\sqrt{2^2\cdot 2^2} - \frac{1}{4}\sqrt{2^2}\sqrt{3} - \frac{3}{2}\sqrt{3}$$

$$4(\sqrt{3}-1)$$

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

$$4(\sqrt{3}-1)$$

$$6 - \frac{1}{2}\sqrt{3} - \frac{3}{2}\sqrt{3}$$

$$4(\sqrt{3}-1)$$

$$6 - \frac{4}{2}\sqrt{3}$$

$$4(\sqrt{3}-1)$$

$$6 - 2\sqrt{3}$$

$$4(\sqrt{3}-1)$$

$$2(3-\sqrt{3})$$

$$3+\sqrt{3}$$

$$3+\sqrt{3}$$

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

$$2((3)^2 - (\sqrt{3})^2)$$

$$2(3\sqrt{3} + \sqrt{3}^2 - 3 - \sqrt{3})$$

$$9-3$$

$$2(3\sqrt{3} - \sqrt{3})$$

$$6\sqrt{3}$$

$$\left[\frac{2\sqrt{3}}{3} \right]$$

42

$$\sqrt{\frac{(1+\sqrt{3})^3}{3\sqrt{12}-6}}$$

$$\sqrt{\frac{(1+\sqrt{3})^2(1+\sqrt{3})}{3\sqrt{2^2 \cdot 3}-6}}$$

$$\frac{\sqrt{(1+\sqrt{3})^2} \sqrt{1+\sqrt{3}}}{\sqrt{3 \cdot \sqrt{2^2 \cdot 3}-6}}$$

$$\frac{\sqrt{(1+\sqrt{3})^2} \sqrt{1+\sqrt{3}}}{\sqrt{6\sqrt{3}-6}}$$

$$\frac{(1+\sqrt{3})\sqrt{1+\sqrt{3}}}{\sqrt{6(\sqrt{3}-1)}}$$

$$\frac{(1+\sqrt{3})\sqrt{1+\sqrt{3}} \cdot \sqrt{6}}{\sqrt{6} \sqrt{\sqrt{3}-1} \sqrt{6}}$$

$$\frac{(1+\sqrt{3})(\sqrt{1+\sqrt{3}})\sqrt{6}}{\sqrt{6}^2 \sqrt{\sqrt{3}-1}}$$

$$\frac{(1+\sqrt{3})(\sqrt{1+\sqrt{3}})\sqrt{6}}{6 \cdot \sqrt{\sqrt{3}-1}} \cdot \frac{\sqrt{\sqrt{3}-1}}{\sqrt{\sqrt{3}-1}}$$

$$\frac{(1+\sqrt{3}) \cdot \sqrt{(\sqrt{3}+1)(\sqrt{3}-1)} \cdot \sqrt{6}}{6(\sqrt{\sqrt{3}-1})^2}$$

$$\frac{(1+\sqrt{3})\sqrt{\sqrt{3}^2-1^2} \sqrt{6} \cdot (\sqrt{3}+1)}{6(\sqrt{3}-1)}$$

$$\frac{(1+\sqrt{3})\sqrt{2} \cdot \sqrt{6} \cdot (\sqrt{3}+1)}{6(\sqrt{3}-1)}$$

$$\frac{(1+\sqrt{3})^2 \sqrt{12}}{6 \cdot 2}$$

$$\frac{(1+2\sqrt{3}+\sqrt{3}^2)\sqrt{12}}{12}$$

$$\frac{(4+2\sqrt{3})\sqrt{12}}{12}$$

$$\frac{4\sqrt{2^2 \cdot 3} + 2\sqrt{3 \cdot 12}}{12}$$

$$\frac{8\sqrt{3} + 2\sqrt{36}}{12}$$

$$\frac{8\sqrt{3}}{12} + \frac{2 \cdot 6}{12}$$

$$\boxed{\frac{2\sqrt{3}}{3} + 1}$$