1.

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

2.

$$\frac{a}{x+\sqrt{y}+z+\sqrt{u}}=a\frac{x+z-(\sqrt{y}+\sqrt{u})}{(x+z)^2-(\sqrt{y}+\sqrt{u})^2}=a\frac{x+z-(\sqrt{y}+\sqrt{u})}{(x+z)^2-y-u-2\sqrt{yu}}=$$

$$=a\frac{(x+z-\sqrt{y}-\sqrt{u})[(x+z)^2-y-u+2\sqrt{yu}]}{[(x+z)^2-y-u]^2-4yu}.$$

3.

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

$$=2^4\sqrt{2}\frac{\sqrt{2-\sqrt{2}}}{\sqrt{2}}\cdot\frac{\sqrt{2-\sqrt{2+\sqrt{2}}}}{\sqrt{2-\sqrt{2}}}\cdot\frac{\sqrt{2-\sqrt{2+\sqrt{2+\sqrt{2}}}}}{\sqrt{2-\sqrt{2+\sqrt{2}}}}=2^4\sqrt{2-\sqrt{2+\sqrt{2+\sqrt{2}}}}.$$

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