

1.

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

2.

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

3.

$$\begin{aligned} &2 \cdot \frac{2}{\sqrt{2}} \cdot \frac{2}{\sqrt{2 + \sqrt{2}}} \cdot \frac{2}{\sqrt{2 + \sqrt{2 + \sqrt{2}}}} \cdot \frac{2}{\sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2}}}}} = \\ &= 2^4 \sqrt{2} \frac{\sqrt{2 - \sqrt{2}}}{\sqrt{2}} \cdot \frac{\sqrt{2 - \sqrt{2} + \sqrt{2}}}{\sqrt{2 - \sqrt{2}}} \cdot \frac{\sqrt{2 - \sqrt{2 + \sqrt{2 + \sqrt{2}}}}}{\sqrt{2 - \sqrt{2 + \sqrt{2}}}} = 2^4 \sqrt{2 - \sqrt{2 + \sqrt{2 + \sqrt{2}}}}. \end{aligned}$$

(Kirchknopf Ervin, Budapest.)

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