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~~18~~ a)

$$a = 1 + \sqrt{2}$$

$$\begin{aligned} a^2 - 2a - 1 &= (1 + \sqrt{2})^2 - 2(1 + \sqrt{2}) - 1 \\ &= 1 + 2\sqrt{2} + 2 - 2 - 2\sqrt{2} - 1 \\ &= \underline{0}. \end{aligned}$$

$$b) \quad a^2 - 2a - 1 = 0$$

$$a - 2 - \frac{1}{a} = 0$$

$$a = 2 + \frac{1}{a}$$

$$\underline{1 + \sqrt{2} = 2 + \frac{1}{a}}$$

$$\underline{\underline{\sqrt{2} = 1 + \frac{1}{a}}}$$

$$\begin{aligned}
 c) \quad \sqrt{2} &= 1 + \frac{1}{a} \\
 &= 1 + \frac{1}{2 + \frac{1}{a}} \\
 &= 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{a}}} \\
 &= 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{a}}}}
 \end{aligned}$$

