The question requests we determine the maximal area, so we substitute $p = \sqrt{2} - 1$ into equation (8) and simplify. We acquire

$$\begin{aligned} A_{\max} &= 1 - \frac{\sqrt{2}-1}{2} + \frac{\sqrt{2}-1-1}{2(\sqrt{2}-1+1)} \\ &= 1 - \frac{\sqrt{2}-1}{2} + \frac{\sqrt{2}-2}{2\sqrt{2}} \\ &= \frac{2\sqrt{2}-2+\sqrt{2}+\sqrt{2}-2}{2\sqrt{2}} \\ &= \frac{4\sqrt{2}-4}{2\sqrt{2}} \\ &= 2 - \sqrt{2} \end{aligned}$$

as required.