Aufgabe 2

(2 c)

Es gilt

$$\bar{s}_{2n} = \frac{s_n}{\sqrt{2+\sqrt{4-s_n^2}}} \qquad \textit{und} \qquad s_{2n} = \sqrt{2-\sqrt{4-s_n^2}}. \tag{1}$$

Es folgt

$$\frac{s_{2n}^2}{\bar{s}_{2n}^{\,2}} = \frac{(2-\sqrt{4-s_n^2})(2+\sqrt{4-s_n^2})}{s_n^2} = \frac{4-(4-s_n^2)}{s_n^2} = 1, \tag{2}$$

wobei die Binomische Formel, $(a+b)(a-b) = a^2 - b^2$, benutzt wurde.
Es gilt

$$\bar{t}_{2n} = \frac{2t_n}{\sqrt{4+t_n^2}+2} \qquad \textit{und} \qquad t_{2n} = \frac{2}{t_n}\left(\sqrt{4+t_n^2}-2\right). \tag{3}$$

Es folgt

$$\frac{t_{2n}}{\bar{t}_{2n}} = \frac{2(\sqrt{4+t_n^2}-2)(\sqrt{4+t_n^2}+2)}{2t_n^2} = 1. \tag{4}$$

Also gilt $\bar{s}_{2n} = s_{2n}$ und $\bar{t}_{2n} = t_{2n}$.