$$\left(1 + \frac{1}{n(n+2)}\right)^{-1} \cdot \frac{n+2}{n+1} = \left(\frac{n(n+2)+1}{n(n+2)}\right)^{-1} \cdot \frac{n+1}{n+2} = \frac{n(n+2)}{n(n+2)+1} \cdot \frac{n+1}{n+2} = \frac{n(n+1)}{n^2+2n+1} = \frac{n(n+1)}{(n+1)^2} = \frac{n}{n+1}$$