b) $x_n = \frac{1}{\sqrt{n(n+1)}} + \frac{1}{\sqrt{n(n+2)}} + \dots + \frac{1}{\sqrt{n(n+n)}}$

$$x_n = \sum_{K=1}^{n} \frac{1}{\sqrt{n(n+K)}} = \frac{1}{n} \sum_{K=1}^{n} \frac{\sqrt{n}}{\sqrt{n+K}} = \frac{1}{n} \sum_{K=1}^{n} \sqrt{\frac{n}{n+K}} =$$

$$= \frac{1}{n} \sum_{K=1}^{n} \sqrt{\frac{1}{1+\frac{K}{n}}}$$

Consideremos $f : [0,1] \longrightarrow \mathbb{R}$

$$f(x) = \frac{1}{\sqrt{1+x}} \quad \forall x \in [0,1]$$

Por la regla de Barrow (la función es continua para todo el dominio, y por tanto integrable)

$$\int_0^1 f(x)dx = \int_0^1 \frac{dx}{\sqrt{1+x}} = 2(1+x)^{1/2} \Big|_0^1 = 2\sqrt{2} - 2$$

Por último, se tiene:

$$\int_0^1 f(x)dx = \lim_{n\to\infty} \frac{1}{n} \sum_{K=1}^{n} f\left(\frac{K}{n}\right) = \lim_{n\to\infty} \frac{1}{n} \sum_{K=1}^{n} \sqrt{\frac{1}{1+\frac{K}{n}}} =$$

$$= \lim_{n\to\infty} x_n = \boxed{2\sqrt{2} - 2}$$