

Az $ACC_1C_2C_3 \dots C_n$ tört vonal hossza

$$\begin{aligned} S &= AC + CC_1 + C_1C_2 + C_2C_3 + \dots + C_{n-1}C_n = \\ &= \frac{a}{\sqrt{2}} + \frac{a}{2} + \frac{a}{2\sqrt{2}} + \frac{a}{4} + \dots + \frac{a}{(\sqrt{2})^{n+1}} = \\ &= \frac{a}{\sqrt{2}} \left[1 + \frac{1}{\sqrt{2}} + \frac{1}{(\sqrt{2})^2} + \frac{1}{(\sqrt{2})^3} + \dots + \frac{1}{(\sqrt{2})^n} \right] = \\ &= \frac{a}{\sqrt{2}} \frac{1 - \frac{1}{(\sqrt{2})^{n+1}}}{1 - \frac{1}{\sqrt{2}}} \end{aligned}$$

A háromszögek területeinek összege

$$\begin{aligned} T &= ABC\Delta + BCC_1\Delta + BC_1C_2\Delta + BC_2C_3\Delta + \dots + BC_{n-1}C_n\Delta = \\ &= \frac{a^2}{4} + \frac{a^2}{8} + \frac{a^2}{16} + \frac{a^2}{32} + \dots + \frac{a^2}{2^{n+2}} = \\ &= \frac{a^2}{4} \left(1 + \frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \dots + \frac{1}{2^n} \right) = \frac{a^2}{4} \frac{2^{n+1} - 1}{2^n} = a^2 \frac{2^{n+1} - 1}{2^{n+2}}. \end{aligned}$$

Ha n végtelenné lesz, akkor

$$S = a(\sqrt{2} + 1)$$

és

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

(Rosenthal Miksa, Pécs.)

Megoldások száma: 38.