14.37

fredag 23 december 2022 10:06

$$A = \int_0^3 2\pi f(x)\sqrt{1+f'(x)^2}\,dx = \int_0^3 2\pi \cdot 2\sqrt{x}\cdot\sqrt{1+\left(\frac{1}{\sqrt{x}}\right)^2}\,dx =$$

$$= 4\pi\int_0^3 \sqrt{x}\cdot\sqrt{1+\frac{1}{x}}\,dx = 4\pi\int_0^3 \sqrt{x+1}\,dx =$$

$$= 4\pi\,\frac{2}{3}\left[(x+1)^{3/2}\right]_0^3 = \frac{8\pi}{3}\left(4^{3/2}-1\right) = \frac{8\pi\cdot 7}{3} = \underline{\underline{\frac{56\pi}{3}}}\ \text{a.e}$$