There is a nonconstant function $f: \mathbb{R} \to \mathbb{R}$ such that

i. $f(0)=2$;

ii. $f$ is continuously differentiable;

iii. for each positive $X$, if $S_X$ is the solid obtained by revolving about the x-axis the region bounded by the x-axis, the graph of $f$, and the vertical lines $x=0$ and $x=X$, then the surface area of $S_X$ (excluding the circular "ends") equals the volume of $S_X$.

Find $f$. 