Heated sphere

Find the temperature of a metallic sphere near flat black-body plate heated to $T_0$. 
The heat radiation absorbed by the cross section of the sphere should equal to the radiation from the surface of the sphere.

\[ \sigma T_0^4 \pi a^2 = \sigma T^4 4\pi a^2 \quad \Rightarrow \quad T = \frac{T_0}{\sqrt{4}} \]