Special Problem 3-4.2

Current is flowing in a region with density:

\[ J(\vec{r}) = \frac{r}{8\pi} \hat{a}_r + r \cos \phi \hat{a}_\theta + \cos \theta \sin \phi \hat{a}_\phi \left[ \frac{A}{m^2} \right] \]

A sphere with radius 2 meters, centered at the origin, encloses at one moment in time a charge of 5 Colombs.

How much charge is enclosed by this sphere one second later?