Special Problem 3-4.2

Current is flowing in a region with density:

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

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?