1.3.7 Evaluate the closed-surface integral of the vector $\mathbf{A} = 3\mathbf{u_r}$ over the spherical surface that has a radius a.

$$\begin{aligned}
\oint \mathbf{A} \bullet \mathbf{ds} &= \int_{\phi=0}^{2\pi} \int_{\theta=0}^{\pi} 3\mathbf{u_r} \bullet r^2 \sin\theta \mathrm{d}\theta \mathrm{d}\phi \mathbf{u_r} \\
&= \int_{\phi=0}^{2\pi} \int_{\theta=0}^{\pi} 3r^2 \sin\theta \mathrm{d}\theta \mathrm{d}\phi \\
&= -\int_{\phi=0}^{2\pi} 3r^2 \cos\theta|_{\theta=0}^{\pi} \mathrm{d}\phi \\
&= -\int_{\phi=0}^{2\pi} 3r^2(-1-1)\mathrm{d}\phi \\
&= \int_{\phi=0}^{2\pi} 6r^2 \mathrm{d}\phi \\
&= 6r^2\phi|_{\phi=0}^{2\pi} \\
&= 12\pi r^2 \\
&= 12\pi a^2
\end{aligned}$$