

25 pts.

3. Compute the total flux,

$$\iint_S \vec{F} \cdot \vec{n} \, dS,$$

of the vector field

$$\vec{F} = r^5 \hat{e}_r + 3 \sin \theta \hat{e}_\phi$$

out through sphere

$$S: x^2 + y^2 + z^2 = a^2.$$

Be sure to state and justify your choice of your surface or volume element clearly and completely.

