Question 15

The surface S is the sphere with Cartesian equation

$$x^2+y^2+z^2=4$$

a) By using Spherical Polar coordinates, (r,θ,φ), evaluate by direct integration the following surface integral

$$I=\iint_S \left(x^4+xy^2+z\right)dS\,.$$

b) Verify the answer of part **(a)** by using the Divergence Theorem.

$$\frac{256\pi}{5}$$