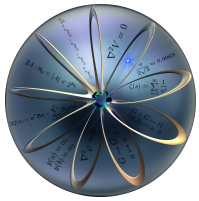

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example of integration over sphere with respect to surface area

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As an example of how to use the formula derived in http://planetmath.org/node/6664example 1, let us consider the following example:

$$\int_S (\sin u \cos v - \sin v)^2 d^2A = \int_0^{2\pi} \int_0^{\pi} (\sin u \cos v - \sin v)^2 \sin u \, du \, dv =$$

$$\int_0^{2\pi} \int_0^{\pi} \left(\sin^3 u \cos^2 v - 2 \sin^2 u \sin v \cos v + \sin u \sin^2 v\right) \, du \, dv =$$

$$\int_0^{2\pi} \left(2 \cos^2 v - \frac{2}{3} \cos^2 v - \pi \sin v \cos v + 2 \sin^2 v\right) \, dv =$$

$$2\pi - \frac{2\pi}{3} - 0 + 2\pi = \frac{10\pi}{3}$$

To return to the main entry http://planetmath.org/node/6660click here.