Parametrización de la superficie:

$\overline{\Phi}(u,v) = (u; v; u^2+v^2+3)$ $\quad v \in [-\sqrt{1-u^2}; \sqrt{1-u^2}]$

$\overline{\Phi}_u = (1; 0; 2u)$ y $\overline{\Phi}_u \wedge \overline{\Phi}_v = (-2u; -2v; 1)$

$\overline{\Phi}_v = (0; 1; 2v)$

$X_\omega(x,y,z) = (x^2y; -xy^2; 1)$

$X_\omega(\overline{\Phi}(u,v)) = (u^2v; -uv^2; 1)$

$X_\omega(\overline{\Phi}(u,v)) \cdot \overline{\Phi}_u \wedge \overline{\Phi}_v = (u^2v; -uv^2; 1) \cdot (-2u, -2v; 1)$

$= 2v^3u - 2u^3v + 1$

$$\int_0^1 \int_{-\sqrt{1-u^2}}^{\sqrt{1-u^2}} 2v^3u - 2u^3v + 1 \, dv \, du$$

$$\int_0^1 \Big(\underbrace{2u \frac{v^4}{4} \Big|_{-\sqrt{1-u^2}}^{\sqrt{1-u^2}}}_{=0} \underbrace{- 2u^3 \cdot \frac{v^2}{2} \Big|_{-\sqrt{\ }}^{+\sqrt{\ }}}_{=0} + v \Big|_{-\sqrt{\ }}^{+\sqrt{\ }} \Big) du$$

$$\int_0^1 2\sqrt{1-u^2} \, du$$

$u = sen(t)$

$du = \cos(t) dt$

$2\int_0^{\pi/2} |\cos t| \cdot \cos(t) \, dt$ → entre 0 y $\pi/2$ el coseno es positivo entonces queda:

$$2\int_0^{\pi/2} \cos^2 = \frac{\pi}{2}.$$