17. Find the volume of the region between $z = 9 - x^2 - y^2$ and the xy plane.

176

$$Vol = \int_0^{2\pi} \int_0^3 r(9-r^2)\,dr\,d\theta = \left(\frac{9r^2}{2} - \frac{r^4}{6} \Bigg]^3 \right) 2\pi$$

$$= \left(\frac{81}{2} - \frac{81}{4} \right) 2\pi$$

$$= \frac{81}{4} 2\pi$$

$$= \boxed{\frac{81\pi}{2}}$$