4)

¡Iba multiplicando, no sumando!

$$\int_0^{2\pi} 2\,\frac{\ln(R^3+1)}{3}\,d\theta = \frac{2}{3}\ln(R^3+1)\cdot\theta\Big|_0^{2\pi} = \boxed{\frac{4\pi}{3}\cdot\ln(R^3+1)}$$