

#1: Item 1

#2:  $f(x, y, z) := y$

#3:  $g(x, y) := \sqrt{(1 - x^2 - y^2)}$

#4:  $x := r \cdot \cos(\theta)$

#5:  $y := r \cdot \sin(\theta)$

#6:  $r \in \text{Real } (0, \infty)$

#7:  $\frac{d}{dx} g(x, y)$

#8: 
$$-\frac{r \cdot \cos(\theta)}{\sqrt{(1 - r^2)}}$$

#9:  $\frac{d}{dy} g(x, y)$

#10: 
$$-\frac{r \cdot \sin(\theta)}{\sqrt{(1 - r^2)}}$$

#11:  $f(x, y, z) \cdot \sqrt{\left(1 + \left(\frac{d}{dx} g(x, y)\right)^2 + \left(\frac{d}{dy} g(x, y)\right)^2\right)}$

#12: 
$$\int_0^{\pi/2} \int_0^1 f(x, y, z) \cdot \sqrt{\left(1 + \left(\frac{d}{dx} g(x, y)\right)^2 + \left(\frac{d}{dy} g(x, y)\right)^2\right)} \cdot r \, dr \, d\theta$$

#13: 
$$\int_0^{\pi/2} \int_0^1 -\frac{r^2 \cdot \sin(\theta)}{\sqrt{(1 - r^2)}} \, dr \, d\theta$$

#14: Esta integral deben desarrollarla y no copiarla del celular

#15: 
$$\frac{\pi}{4}$$