$$\begin{aligned}\int_0^1 \int_0^v 8\sqrt{1-v^2}\,du\,dv &= \int_0^1 \left[8u\sqrt{1-v^2}\right]_{u=0}^{u=v} dv = \int_0^1 8v\sqrt{1-v^2}\,dv \\ &= -\tfrac{8}{3}(1-v^2)^{3/2}\Big]_0^1 = -\tfrac{8}{3}(0-1) = \tfrac{8}{3}\end{aligned}$$