Answer on Question #70315, Math / Calculus

Find by using polar coordinated in R^2 the volume of the region bounded by the paraboloid z= 16-x^2-y^2 and the xy-plane (having equation z=0)

Solution.

V=$\iint_{x^2+y^2\leq 16}(16-x^2-y^2)dxdy$ =// in polar coordinate x=rcost, y= rsint, dxdy=rdrdt

//=$\int_0^{2\pi}\int_0^4(16-r^2)rdrdt = \int_0^{2\pi}\int_0^4(16-r^2)rdrdt$=2$\pi\int_0^4(16r-r^3)dr$=128 π

Answer: V=128 π