

1. Set up the interval to find the volume under the function $z = f(x, y) = x^2 + y^2$ over the region defined by $y = 2x + 2$, $y = 0$ and $x + y = 2$.

2. Reverse the order of integration of $\int_0^{18} dy \int_0^{\sqrt{y/2}} f(x, y) dx$.

3. Consider the circle $x^2 + y^2 = p^2$. Use polar coordinates to evaluate the volume above the circle and below the function $z = f(x, y) = 1$, thus helping to confirm the formula for the area of a circle.