

Show all work. 5 points each. Be sure to draw the region D for problem 2.

1. If E is the region enclosed the paraboloid $z = x^2 + y^2$ and the plane $z = 4$ convert $\iiint_E x^2 + y^2 dV$ into cylindrical coordinates and evaluate.

2. Use the transformation $x = u/v$, $y = v$ to convert the integral $\iint_R xy dA$ into an integral in u and v if R is enclosed by $y = x$, $y = 3x$, $xy = 1$ and $xy = 3$.