Polar and Cylindrical Coordinates

Melanie Dennis

Dartmouth College
Math13

April 6, 2018

Dartmouth

Polar and Cylindrical Coordinates Problems

1 Find the volume of the region inside the cylinder $x^2 + y^2 = 9$, outside the cylinder $x^2 + y^2 = 1$, and between the planes $z = 0$ and $z = 4$. Does this volume make sense?

2 Evaluate $\int_0^4 \int_0^{\sqrt{16-x^2}} \tan^{-1} \frac{y}{x} dy dx$.

Challenge Problems

1 Find the volume of the region inside both the cylinder $x^2 + y^2 = 1$ and the sphere $x^2 + y^2 + z^2 = 4$.

🛡️ Dartmouth