Lecture 26 Worksheet

July 23, 2021

1. Parameterize the upper half of the cone $z^2 = x^2 + y^2$ in two (significantly) different ways.

2. Let R be the surface given by $\vec{r}(s, t) = \langle \cos(s), t, t \cdot \sin(s) \rangle$ with $0 \le s \le 2\pi$ and $0 \le t \le 5$. Let $f(x, y, z) = z^2 + x^2 y^2$. Set up the integral

$$\iint_R f(x, y, z)\, dS$$

3. Let R be the part of the cylinder $y^2 + z^2 = 4$ between $x = 1$ and $x = 5$. Evaluate the integral

$$\iint_R (xy^2 + xz^2)\, dS$$