

Math 324 Quiz 2

February 23, 2017

Problem 1. Convert the point $(3, 4, 5)$ from cartesian coordinates to spherical coordinates.

Problem 2. Convert the point $(1, \pi/6, \pi/2)$ from spherical coordinates to cartesian coordinates.

Problem 3. Determine the Jacobian of the linear transformation

$$\begin{aligned}u &= x + 2y \\v &= 2y\end{aligned}$$

Problem 4. Using spherical coordinates, set up an integral to find the integral of $f(x, y, z) = x + y$ over the region R above the cone $z = 2\sqrt{x^2 + y^2}$ and below the sphere $x^2 + y^2 + z^2 = 16$. **Do not evaluate it**