

Surface Area.

Spring 2016

Attendance Quizzes

April 6, 2016

Quiz 26 Surface Area.

Set up the double integral to find the area of the paraboloid $z = 25 - x^2 - y^2$ above the xy -plane.

The formula to integrate for surface area of $z = f(x, y)$ above a region R is $\iint_R \sqrt{1 + f_x^2 + f_y^2} dA$.

Hint: For this problem, polar coordinates are best!

Answer:

$$\int_{\theta=0}^{2\pi} \int_{r=0}^5 \left(\sqrt{1 + 4r^2} \right) r dr d\theta = 2\pi \left(\frac{101^{3/2} - 1}{12} \right) = 84.50311981$$