

Calculus: Inclass Homework 12

June 12th, 2008

1. Use a suitable transformation to compute the triple integral

$$\iiint_E dV,$$

where $E = \{(x, y, z) | x^2/a^2 + y^2/b^2 + z^2/c^2 \leq 1\}$.

2. Consider the following force field

$$\mathbf{F}(x, y) = \frac{2x}{y} \mathbf{i} + \left(\frac{1 - x^2}{y^2} \right) \mathbf{j},$$

where $y > 0$.

- (a) Show that \mathbf{F} is conservative and find a potential function.
(b) Compute the work done by \mathbf{F} in moving a particle along the straight line from $(0, 1)$ to $(3, 2)$.