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14.03.2017

Math 102 – Section 16– Quiz 4

Problem 1. Suppose that over a certain region of space the electrical potential V is given by

$$V(x, y, z) = ln(3x + 6y + 9z).$$

(a)Find the rate of change of the potential at $P(1, 1, 1)$ in the direction of the point $Q(5, 13, 7)$.
(b)Find the maximum rate of change of V at P and the direction in which it occurs.

Problem 2. Show that the ellipsoid $3x^2 + 2y^2 + z^2 = 9$ and the sphere $x^2 + y^2 + z^2 - 8x - 6y - 8z + 24 = 0$ are tangent to each other at the point $(1, 1, 2)$.