King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Semester (111) November 14, 2011

Math 302
Quiz 3

Name: .....

ID: .....

Exercise 1. Find the directional derivative of

$$f(x, y, z) = 2x^2 + 3y^2 + z^2$$

at $P = (2, 1, 3)$ in the direction of $\mathbf{u} = (1, 0, -2)$.

Exercise 2. Evaluate the line integral

$$\int_{\mathcal{C}} x dx - yz dy + e^z dz,$$

where $\mathcal{C}$ is the curve with coordinate functions $x = t^3, y = -t, z = t^2$ for $1 \leq t \leq 2$.

Exercise 3. Evaluate the following line integral with respect to arc length

$$\int_{\mathcal{C}} xy^2 ds,$$

where $\mathcal{C}$ is the curve with coordinate functions $x = 2\cos t, y = 2\sin t, z = 3$ for $0 \leq t \leq \frac{\pi}{2}$.