Sultan Qaboos University-College of Science
Department of Mathematics and Statistics
MATH 3171 - Linear Algebra & Multivariate Calculus for Engineers
Spring Semester 2008 - $\boxed{\textbf{QUIZ \# 4-A}}$

Date: 5 May 2008   **Time Allowed: 20 minutes**
NAME: **ID NO.**

1. [5 marks] Evaluate the integral $\int_C (x + xy^2)ds$, where $C : r(t) = [2\cos t, 2\sin t]$, $t \in [0, \frac{\pi}{2}]$.

2. [6 marks] Find the volume of the region beneath $z = xy$ and the triangle with vertices $(0,0)$, $(0,2)$, and $(1,0)$.

3. [4 marks] Let $I = \int_{(0,1,1)}^{(1,2,1)} 2xy\,dx + x^2\,dy + (2z + 3)\,dz$. Show that the form under the integral sign is exact and evaluate I.

Date: 5 May 2008   **Time Allowed: 20 minutes**
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1. [5 marks] Evaluate the integral $\int_C (y + xy^2)ds$, where $C : r(t) = [2\cos t, 2\sin t]$, $t \in [0, \frac{\pi}{2}]$.

2. [6 marks] Find the volume of the region beneath $z = x^2 y$ and the triangle with vertices $(0,0)$, $(1,0)$, and $(1,2)$.

3. [4 marks] Let $I = \int_{(0,1,1)}^{(1,2,1)} 2xy\,dx + x^2\,dy - (2z+3)\,dz$. Show that the form under the integral sign is exact and evaluate I.

Date: 5 May 2008   **Time Allowed: 20 minutes**
NAME: **ID NO.**

1. [5 marks] Find the work done by the force $F(x,y) = -x\mathbf{i} + y^2\mathbf{j}$ applied to an object that moves along the quarter circle from $(2,0)$ to $(0,2)$.

2. [6 marks] Find the volume of the region beneath $z = x^2y$ and the triangle with vertices $(0,0)$, $(1,0)$, and $(1,2)$.

3. [4 marks] Let $I = \int_{(0,1,1)}^{(1,2,1)} 4xy^2dx + 4x^2ydy + (2z+3)dz$. Show that the integral is path independent and evaluate I.

Date: 5 May 2008   Time Allowed: 20 minutes
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1. [5 marks] Find the work done by the force $F(x,y) = (x+2)\mathbf{i} + (2x+y)\mathbf{j}$ applied to an object that moves along the parabola $y = x^2$ from $(0,0)$ to $(2,4)$.

2. [6 marks] Find the volume of the region beneath $z = xy$ and the triangle with vertices $(0,0)$, $(0,2)$, and $(1,0)$.

3. [4 marks] Show that the integral $I = \int_{(0,1,1)}^{(1,2,1)} 4xy^2 dx + 4x^2 y\, dy + (2z+1) dz$ is path independent and evaluate I.