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

Math 201 **Section#: .....** **Serial #: ....** **Quiz 4(a) (Term 181)**

Name : ..... **ID** #..... **Marks** ...../6

1. The integral $\int\int_R \sqrt{9-y^2}\,dA$, where $R = [0,4] \times [0,2]$ represents the volume of a solid. Describe that solid in words.

2. Use Lagrange multipliers method to find maximum and minimum values of $f(x,y) = x^2 - y^2$ subject to the constraint $x^2 + y^2 = 25$.

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

Math 201 **Section#: .....** **Serial #: ....** **Quiz 4(d) (Term 181)**

Name : ..... **ID** #..... **Marks** ...../6

1. Find local minimum value of $f(x, y) = x^3 + y^3 - 6xy$.

2. Write only an expression for Lagrange multiplier method to find extrema of $f(x, y, z) = z - x^2 - y^2$ subject to the constraints $x + y + z = 1$ and $x^2 + y^2 = 4$.

3. Evaluate $\int_{-3}^{3} \int_{0}^{\pi/2} (y + y^2 \cos x)\, dx\, dy$.

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

Math 201 **Section#: .....** **Serial #: ....** **Quiz 4(c) (Term 181)**

Name : ..... **ID** #..... **Marks** ...../6

1. Use a Riemann sum with $m = 3$, $n = 2$ to estimate $\int\int_R (xy)\, dA$ where $R = [0, 6] \times [0, 4]$ and consider the sample points to be upper right corners of the subrectangles.

2. Use Lagrange multipliers method to find maximum and minimum values of $f(x, y) = x - 3y - 1$ subject to the constraint $x^2 + 3y^2 = 16$.

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

Math 201 **Section#: .....** **Serial #: ....** **Quiz 4(b) (Term 181)**

Name : ..... **ID** #..... **Marks** ...../6

1. Use a Riemann sum with $m = n = 2$ to estimate $\int\int_R (x + 2y)\, dA$ where $R = [0, 1] \times [0, 1]$ and consider the sample points to be lower left corners of the subrectangles.

2. Find absolute maximum and minimum values of $f(x, y) = xy - x^3\, y^2$ over $R = \{(x, y) : 0 \leq x \leq 1,\ 0 \leq y \leq 1\}$.