Term Test 2

DATE: March 14, 2016
TIME: 90 minutes
COURSE: MATH 2150
EXAMINER: G.I. Moghaddam

NAME:_____

STUDENT # : _____

Q1 [10]	Q2 [10]	Q3 [10]	Q4 [10]	Q5 [10]	Total [50]

[10] 1. Find maximum and minimum values of the function $f(x, y, z) = 3y$ over the curve of intersection of the plane $z = 2x - y$ and the ellipsoid $2x^2 + y^2 + z^2 = 12$.
Hint: Use Lagrange multipliers.

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[10] 2. Let $f(x,y) = y + 3\sqrt{x^2+y^2}$. Evaluate the double integral $\iint_D f(x,y)dA$ where D is the region bounded by the $y-$axis and $x = \sqrt{2y-y^2}$.

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[10] 3. Find the area of the finite plane region bounded by the curves $y = x^3$, $y = 2x^3$, $x = y^3$ and $x = 3y^3$.

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[10] 4. Let D be the region satisfying $4x + y \geq 3$ and $2x - y \geq 0$. Determine whether the double integral $\displaystyle\int\int_D \frac{1}{\sqrt{x^2 + y + 1}}\, dA$ converges or diverges. Explain your work.

[10] 5. **Set up but do not evaluate** the six triple iterated integrals in Cartesian coordinates for the function $f(x, y, z)$ over the region enclosed by the surfaces $y = 1 - x^2$, $z = 0$ and $y = z$.