

Due Date: May 9, 2011 Monday

NAME:.....

Ali Sinan Sertöz

STUDENT NO:.....

Math 114 Calculus – Homework 4

1	2	3	4	TOTAL
25	25	25	25	100

Please do not write anything inside the above boxes!

Check that there are 4 questions on your booklet. Write your name on top of every page. Show your work in reasonable detail. A correct answer without proper or too much reasoning may not get any credit.

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Q-1) Find the following sums

$$\sum_{n=0}^{\infty} \frac{n^3}{2^n} \quad \text{and} \quad \sum_{n=0}^{\infty} (-1)^n \frac{n^3}{2^n}.$$

Solution:

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Q-2) Find the following limit.

$$\lim_{x \rightarrow 0} \frac{x \sec x^3 \sin x^2 \arctan x^3 - x^6}{x^6 \cos x^2 e^{x^3} \tan(x^4/2)}.$$

Solution:

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Q-3) Find the minimum and maximum values of $f(x, y, z) = xz - y^2$ on the ball $x^2 + y^2 + z^2 \leq 1$.

Solution:

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Q-4) Find the volume of the region that lies inside the cylinder $x^2 + (y - R)^2 = R^2$ and the sphere $x^2 + y^2 + z^2 = 4R^2$, where $R > 0$.

Solution: