MATE 6540 assignment 2

5. Define a mapping of **R** into **R** by

$$f(x) = (1 + e^x)\sin x.$$

Find the adherence values of f: a) as $x \to -\infty$, b) as $x \to +\infty$, c) as $x \to 0$.

6. A family $(A_i)_{i \in I}$ of subsets of a topological space X is said to be locally finite if for each $x \in X$ there is a neighbourhood V of x such that $V \cap A_i = \varnothing$ for all but a finite number of indices $i \in I$. Show that the union of a locally finite family of closed subsets of X is closed in X.

7. Exercise 5 of Chapter III p. 130 in Dixmier.

8. Exercise 6 of Chapter III p. 130 in Dixmier.

9. Exercise 7 of Chapter III p. 131 in Dixmier.

Marks: 9 + 9 + 6 + 15 + 10