**臺北巿立大學**

**103學年度第一學期學士班二、三年級轉學生招生考試試題**

**系 別：**數學系（三年級）

不得使用計算機或任何儀具。

**科 目：**高等微積分

**考試時間：**90分鐘【8:20−9:50】

**總 分：**100分

* **注意：**不必抄題，作答時請將試題題號及答案依照順序寫在答卷上；**限用藍色或黑色筆作答**，使用其他顏色或鉛筆作答者，所考科目以零分計算。**(於本試題紙上作答者，不予計分。)**

**計算證明題（每題10分，共100分）**

1.Prove that every bounded sequence in has a subsequence that converges to some point in .

2.Let  be a sequence in , and ** for all. Show that ****.

3.Let be a continuous function on a closed bounded interval . Prove that  is integrable on .

4.Suppose thatis a function, and each of the partials exists and is continuous on. Prove that *f* is differentiable on .

5.Determine the third-order Taylor formula for the function  about the point .

6.Let be a sequence of real numbers such that.

Show that converges.

7.Prove that the series converges uniformly on

8.Prove that the unit interval (0, 1) in is uncountable.

9. Let *M* be a metric space and a set . *A* is closed if and only if the accumulation points of *A* belong to *A*.

10. Let be open and . Define

.  
 Prove is open.