Individual Oral Test

Analysis and PDE

1. Suppose is a nonsmooth bounded convex function defined on . Prove that is independent of .
2. Consider the property
3. Show that there is no analytic function on with the property .
4. Show that there is an analytic function on with property .
5. Is there an analytic function on with propertysuch that is never an integer, i.e. for all ?
6. Real Analysis.

Let be a measurable subset of with , is a measureable function on .

1. For all , there holds . Then there exists a subset of with , so that .
2. If , then we have
3. (a) Suppose , prove that there exists a absolute constant , such that
4. Suppose , is the unit ball in . Prove that there exists a absolute constant , such that