IUE – MATH 103 – Analytic Geometry

6^{th} Homework

1. Show that C_i, C_∞ and D_j, D_∞ are partitions of A and B, respectively.

2. Show that $h : A \to B$ is an injection.

3. Show that $h : A \to B$ is a surjection.

4. Show that $f[C_{2k}] = D_{2k+1}$ and $g^{-1}[C_{2k+1}] = D_{2k}$.

5. Show that $\aleph_0 \times \aleph_0 \times \aleph_0 = \aleph_0$.

6. Prove of disprove: $\aleph_0^{\aleph_0} = \aleph_1$.

7. Prove of disprove: $3^{\aleph_0} = \aleph_1$.

8. Prove of disprove: $\aleph_0^{2014} = \aleph_1$.

9. Show that any Cauchy sequence is bounded. *Hint: Check the last lecture notes.*

10. Prove or disprove: Any bounded sequence is a Cauchy sequence.