

Group Number:

1. Let a_n be any sequence (not necessarily convergent) with $a_n > 1$. Define b_n by $b_1 = 1$ and $b_{n+1} = a_n b_n$ for $n \geq 1$. Show that
 - (a) b_n is an increasing sequence.
 - (b) If b_n converges then a_n converges to 1.
 - (c) If $a_n \geq c > 1$ for all n then $b_n \rightarrow \infty$.

2. Let S be any subset of \mathbb{R} . Prove that

$$\mathbb{R} = \text{int}S \cup \text{int}S^c \cup \text{bd}S$$

where this union is disjoint.