

Math 3371

Homework #5 Answers

Section 2.5 #1a, #2b

Section 3.2 #2c, #6c

2.5 #1a

Impossible: if the subsequence is bounded, then it has a convergent subseq. by BW. So the original sequence has a convergent subseq.

2.5 #2b

True: The contrapositive is: If (x_n) converges, then (x_n) contains no divergent subseq. This is true, since all subseqs of a convergent sequence converge to the same limit.

3.2 #2c

All pts of A are isolated except 1
no pts of B are isolated.

3.2 #6c

Every nonempty open set contains a rational #.

True!

PP let A be nonempty and open. Take $x \in A$, and since A is open we have $V_\varepsilon(x) \subseteq A$, which is the interval $(x-\varepsilon, x+\varepsilon) \subseteq A$.

By the density of \mathbb{Q} , there is some rational $q \in (x-\varepsilon, x+\varepsilon)$,
so $q \in A$ shown.