Mathematics 3A03 Real Analysis I

http://www.math.mcmaster.ca/earn/3A03

2019 ASSIGNMENT 4

This assignment is **due** on **Friday 8 March 2019 at 1:25pm**.
PLEASE NOTE that you must **submit online** via crowdmark.
You will receive an e-mail from crowdmark with the required link.
Do **NOT** submit a hardcopy of this assignment.

Note: Not all questions will be marked. The questions to be marked will be determined after the assignment is due.

1. Give an example of a sequence of closed sets F_1, F_2, F_3, ..., whose union is neither open nor closed. Can this be achieved with a sequence that contains only finitely many distinct sets?

2. Suppose that $E \subseteq \mathbb{R}$, $K \subseteq \mathbb{R}$, E is closed and K is compact. Show that $E \cap K$ is compact, by proving directly that $E \cap K$ satisfies each of the following equivalent properties:

   (a) closed and bounded;

   (b) Bolzano-Weierstrass property;

   (c) Heine-Borel property.

More questions will be posted in the coming days.

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