Math Homework Week 1

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1 Problem 1

- $\mathcal{G}_1 = \{A, A \subset \mathbb{R}, A \ open\}$

  - if A is an open set on $(-\infty, 0)$ than its complement is $[0, \infty)$
  - According to the definition of a alegebra, A is an $\mathcal{A}$ or $\mathcal{S}$ if it's complement is a closed set. And since A^c is only half closed, $\mathcal{G}_1$ cannot be an algebra

- $\mathcal{G}_2 = \{$ A, A is a finite union of intervals of the form $(a, b], (-\infty, b], and (a, \infty)\}$

  - if $A = \cup_{i=1}^{n}(a_i, b_i]$ where $-\infty \leq a_i \leq b_i \leq \infty$ then
  - $A^c = (\infty,)$

- $\mathcal{G}_3 = \{$ A, A is a countable union of $(a, b], (-\infty, b], and (a, \infty)\}$