Please refer to previous problem sets for instructions, including but not limited to the collaboration policy.

ASSIGNMENT

Liberally peruse pages 59–63 of [DO].

[DO] Exercises 3.2, 3.3, 3.4, and 3.7.

Problem 5. Prove that a polygon of perimeter $p$ can be covered by a disc of diameter $p/2$.

Problem 6. Recall this corollary of Helly theorem, stated in class:

Let $A \subset \mathbb{R}^2$ be a fixed convex set and let $X_1, \ldots, X_n \subset \mathbb{R}^2$ be convex sets such that every three of them intersect a translation of $A$. There exists a translation of $A$ that intersects all sets $X_i$.

For each $i$, let $Y_i = \{y \in \mathbb{R}^2 : (A + y) \cap X_i \neq \emptyset\}$. In order to apply Helly theorem to obtain the corollary, show that the $Y_i$ are convex.