

# Solutions USAMO 2010

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This document contains solutions to the USAMO 2010 problems, written by me during my preparation for the International Mathematical Olympiad.

The content reflects my own understanding and problem-solving process. Some solutions may have been inspired by the work of others or required external help, in which case proper attribution is given (see [Section 3](#)). If you notice any errors or have suggestions for improvement, I would greatly appreciate hearing from you at [samuelbaraujo19@gmail.com](mailto:samuelbaraujo19@gmail.com).

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## 1 Problems

1. Let  $AXYZB$  be a convex pentagon inscribed in a semicircle of diameter  $AB$ . Denote by  $P, Q, R, S$  the feet of the perpendiculars from  $Y$  onto lines  $AX, BX, AZ, BZ$ , respectively. Prove that the acute angle formed by lines  $PQ$  and  $RS$  is half the size of  $\angle XOZ$ , where  $O$  is the midpoint of segment  $AB$ .

## 2 Solutions

### 2.1 Problem 1

### 3 Refereneces