

# Run Nezar Run

Submission deadline: April 28<sup>th</sup> 2024

Little Nezar wants to run from his House at  $A$ , touch the brick wall  $W$  and run to his friend's house at  $B$ . Describe the shortest path Nezar can take.

$A$   
.

$B$   
.

$W$



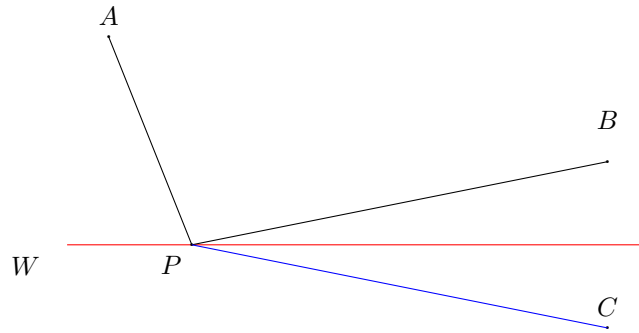
The problem was solved by

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Discussion:

Let  $P$  be the point Omar touches on the wall and  $C$  be the reflection of  $B$  on the wall. Clearly the shortest path from  $A$  to  $P$  is the line segment  $AP$  and the shortest path from  $P$  to  $B$  is the line segment  $PB$ .



Thus, the length of the path for any given point  $P$  is  $|AP| + |PB|$ . Notice that  $|PB| = |PC|$ , hence length of the path is  $|AP| + |PC|$ .

The least value of  $|AP| + |PC|$  is when  $P$  is the point of intersection of  $AC$  and the wall. Thus the shortest path is the one shown in the diagram below.

