

# Mexico 2025/6

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TWITCH SOLVES ISL

Episode 170

## Problem

Let  $ABC$  be a triangle and let  $I$  be the excenter opposite  $A$ . The perpendicular line to  $AI$  through  $I$  intersects lines  $AB$  and  $AC$  at  $E$  and  $F$ , respectively. The circle  $\omega_B$  is tangent to  $EF$  and to  $AB$  at  $B$  such that it is outside triangle  $AEF$ . Analogously, circle  $\omega_C$  is tangent to  $EF$  and to  $AC$  at  $C$  such that it is outside triangle  $AEF$ . Line  $IB$  cuts  $\omega_B$  again at  $X$  and line  $IC$  cuts  $\omega_C$  again at  $Y$ .

Let  $\omega_A$  be the excircle of triangle  $AEF$  opposite vertex  $A$ . Show that the reflection of  $\omega_A$  with respect to  $EF$  is tangent to  $XY$ .

## External Link

<https://aops.com/community/p36502656>

## **Solution**

TODO