In triangle ABC an exterior angle at A measure 170 and <B =80. What is the longest side of a triangle

Solution
Longest side of the triangle always lies opposite the largest angle, so we need to find the largest angle.
The sum of the exterior angle and the interior angle must be equal 180°. Therefore, $\angle BAC = 180° - 170° = 10°$ (interior angle) $\Longrightarrow$

$$\angle A = 10°; \ \angle B = 80°; \ \angle C = 180° - (10° + 80°) = 90°;$$

The longest side of the triangle must be AB, because the longest side of the triangle always lies opposite the largest angle, and $\angle C$ is the largest angle in the triangle ABC.

Answer: the longest side of the triangle is AB.