Babak's Problem

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1 Description of the Problem

We are given an isosceles triangle ABC the angle $\angle BAC$ equal to $20°$. Let point D be a point placed on the line segment $\overline{AB}$, where the distance between the two points A and D is the same as the distance between B and C. Find the angle θ that is defined as the angle $\angle BDC$.

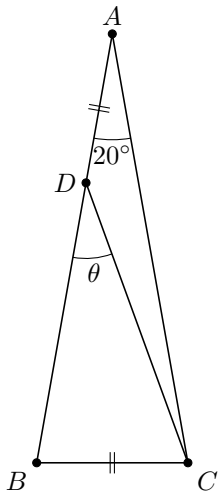

Figure 1: Babak's initial problem

1.1 The Solution

Let's begin by imagining making a copy of the triangle ABC, placing the transformed points B' and C' on the original points A and D respectively, giving us the triangle ADE.

The angle $\angle CAE$ We can conclude that the triangle ACE is an isosceles.