

## A DIFFERENT FORM OF GEOMETRICAL THINKING: ANGLES

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### ABSTRACT

This study presents a different geometrical thinking form for solutions of some Euclidean Geometry problems concerned with the magnitude of angles. This study emphasize that some geometrical problems, without changing their data, are solved by putting to a different geometrical thinking base.

**Keywords:** Euclidean geometry, geometrical thinking, angle.

### INTRODUCTION

Part of the attraction of Euclid geometry is that almost all of its theorems can be pictorially confirmed (Hizarci and Ipek, 2004). In Euclid geometry, this aspect can lead to the formation of different ideas. In this study, a different way of thinking in solving the questions in Euclid geometry will be tried. Those different ideas are based on topological concepts. Kaplan, Konyalıoğlu and Hizarci(2011) state that Using topology, geometric concepts can be defined or incorporated into different forms.

The solutions of Euclidean geometry problems in both geometry lessons and geometry textbooks has often led students to take a narrow view of geometry and has limited their geometrical thinking to viewing geometry creatively and enjoying geometric activities. In this study, some geometrical problems deal with the magnitude of angles, without changing their data which is the magnitude of angles, are solved with a different geometrical thinking base. Because of this, the given geometric shape is firstly transformed into a special shape. According to Hizarci and Konyalıoğlu (2010), some geometrical problems, without changing their data, are solved by using a different geometrical thinking base. Also, Hizarci and Ipek (2004), in their study, focusing on the concept of area in the plane geometry it has been showed that the areas have been invariant with various arrangements made without the data of a geometric figure making use of area axioms.

### METHOD

Hizarci and Konyalıoğlu(2010) stated that each mapping preserves some properties, or leaves them invariants which are metric invariants, such as the length of sides, the magnitude of an angle, and the size of an area in a triangle. In this study, this expression is the key idea to this study for a different geometrical thinking. The following solutions are example for different geometric thinking.

**Example**

In Figure 1,  $ABCD$  and  $EFGB$  are two squares. Find the angle  $\widehat{AHE}$ .

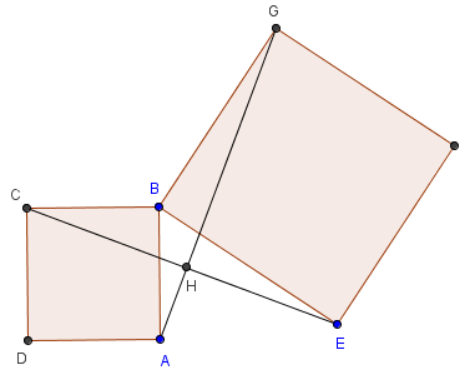


Figure 1

**Solution 1:** In figure 2, if square  $ABCD$  is turned clockwise from point  $A$  until point  $B$  and  $H$  collide with one another, then it is seen that  $m(\widehat{AHE})=90^0$ .

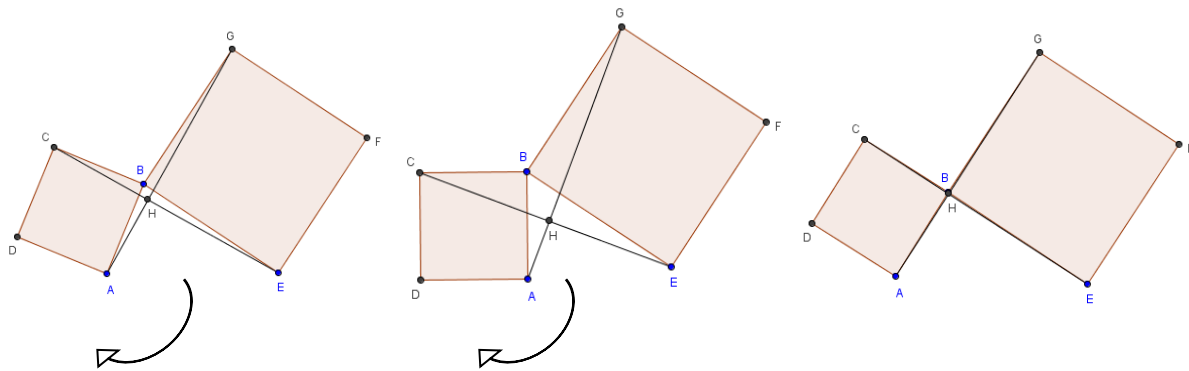


Figure 2

**Solution 2:** In figure 3, if square  $EFGB$  is turned counter clockwise from point  $E$  until point  $B$  and  $H$  collide with one another, then it is seen that  $m(\widehat{AHE})=90^0$ .

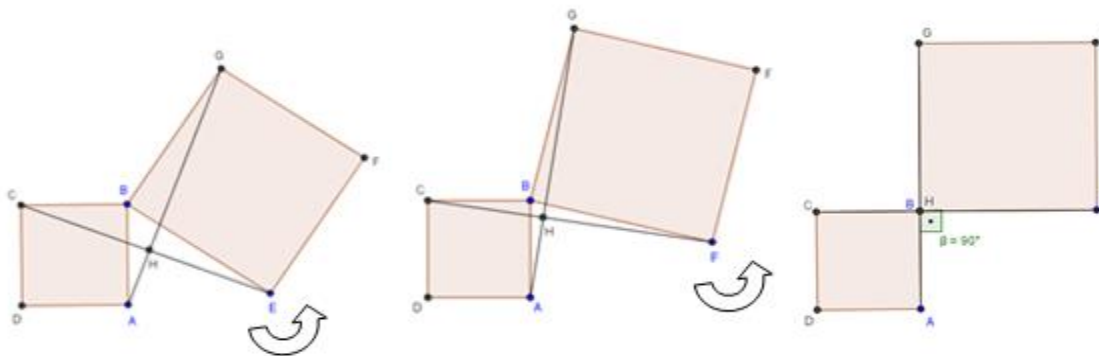


Figure 3

## **CONCLUSION**

Different solutions can be reached with similar rotations, without changing the given data, such as solution 1 and 2.

## **REFERENCES**

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