SECONDARY MATH I // MODULE 6 TRANSFORMATIONS AND SYMMETRY - 6.6

Lesson 6 Symmetries of Regular Polygons

A Solidify Understanding Task



A line that reflects a figure onto itself is called a **line of symmetry**. A figure that can be carried onto itself by a rotation is said to have **rotational symmetry**. A **diagonal of a polygon** is any line segment that connects non-consecutive vertices of the polygon.

For each of the following regular polygons, describe the rotations and reflections that carry it onto itself: (be as specific as possible in your descriptions, such as specifying the angle of rotation)

2. A square 1. An equilateral triangle lines Rotational Symmetry 120°, 240°, 360° 3 lines 2 diagonals 2 I bisectors met all 1 bisector 4. A regular hexagon 3. A regular pentagon lo lines of Symmetr 5 lines Of Symmetry 3 diagonals 3 L bised all L bisectors Rotational Rotational Symmetry 72°, 144°, 216°, 288°, 360 .(10 Mathematics Vision Project mathemat Licensed under the Creative Commons Attribution CC BY 4.0 vision project mathematicsvisionproject.org

SECONDARY MATH I // MODULE 6 TRANSFORMATIONS AND SYMMETRY - 6.6

> 45,90,135,180 225,270,315,360

- 5. A regular octagon
- 8 lines of Symmetry; 4 diagonals 4 \perp bisectors $\frac{360^{\circ}}{8} = 45^{\circ}$ Rotational Symmetry

6. A regular nonagon



What patterns do you notice in terms of the number and characteristics of the lines of symmetry in a regular polygon?

- n sides = n lines of symmetry
 odd sides : lines of symmetry are all _ bisectors
- even sides: ½ are diagonals & ½ are 1 bisectors

What patterns do you notice in terms of the angles of rotation when describing the rotational symmetry in a regular polygon? n = # of sides

multiples of <u>360°</u>

Mathematics Vision Project Licensed under the Creative Commons Attribution CC BY 4.0 mathematicsvisionproject.org

