Take out Yesterday's Worksheet

6.5 - Ready, Set, Go

Ready

Topic: Polygons, definition and names

1. What is a polygon? Describe in your own words what a polygon is.

A figure w/ atleast 3 straight sides closed

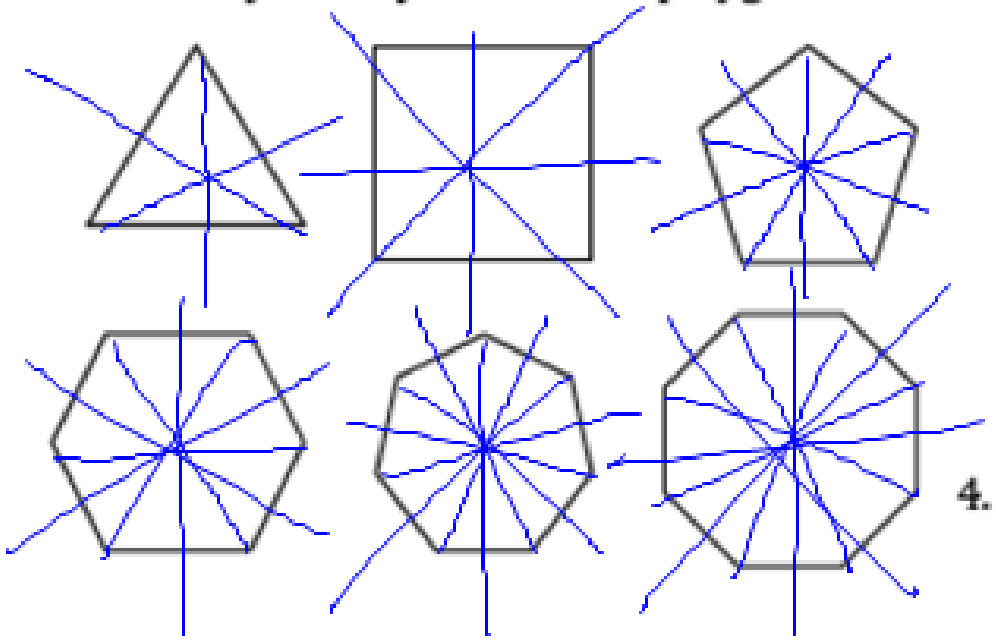
2. Fill in the names of each polygon based on the number of sides the polygon has.

Number of Sides	Name of Polygon
3	Triangle
4	Square
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon.

Set

Topic: Lines of symmetry and diagonals

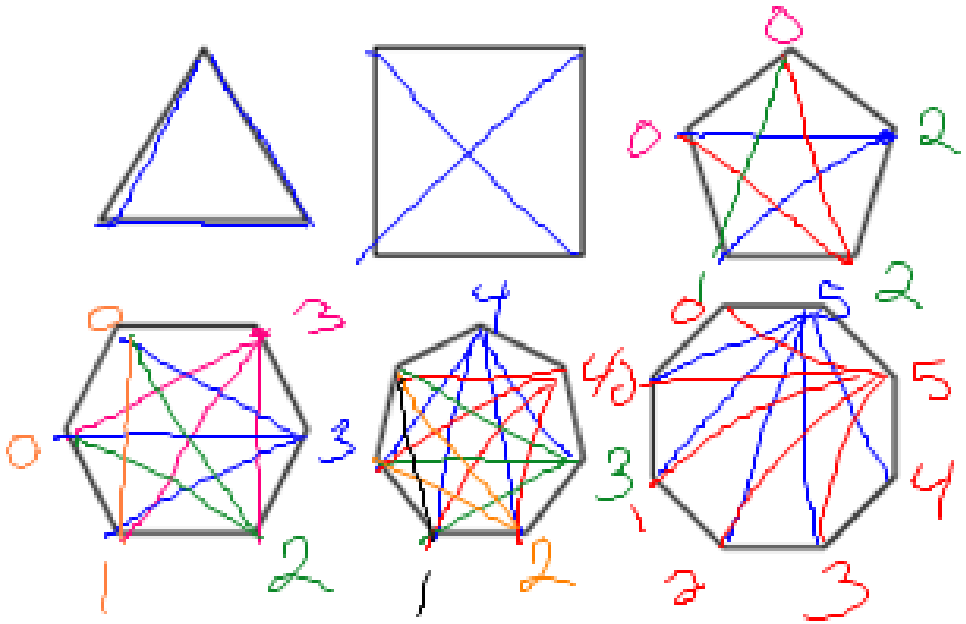
3. Draw the lines of symmetry for each regular polygon, fill in the table including an expression for the number of lines of symmetry in a ***n***-sided polygon.



Number of Sides	Number of lines of symmetry
3	3
4	4
5	5
6	6
7	7
8	8
n	n

4. Find

all of the diagonals in each regular polygon. Fill in the table including an expression for the number of diagonals in a ***n***-sided polygon.



Number of Sides	Number of diagonals
3	0
4	2
5	5
6	9
7	14
8	20
n	

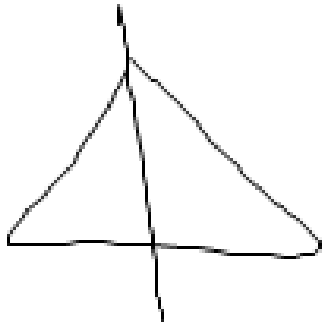
+2 +3 +4 +5 +6

$\frac{n^2-3n}{2}$

$2(n-3)!$

5. Are all lines of symmetry also diagonals? Explain.

No



6. Are all diagonals also lines of symmetry? Explain.

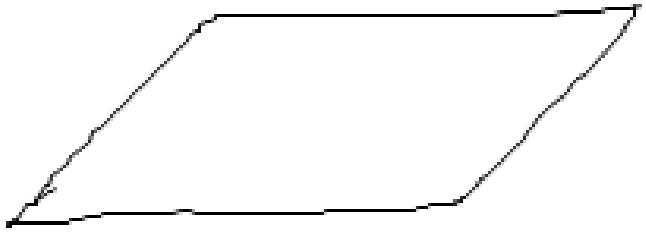
No

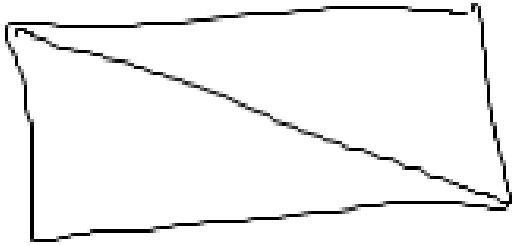
7. What shapes will have diagonals that are not lines of symmetry? Name some and draw them.

5 sides & more.

8. Will all parallelograms have diagonals that are lines of symmetry? If so, draw and explain. If not draw and explain.

No,





Its Cutting Time!!!

Cut out each Shape carefully so we can play with them later.

6.6 Symmetries of Regular Polygons

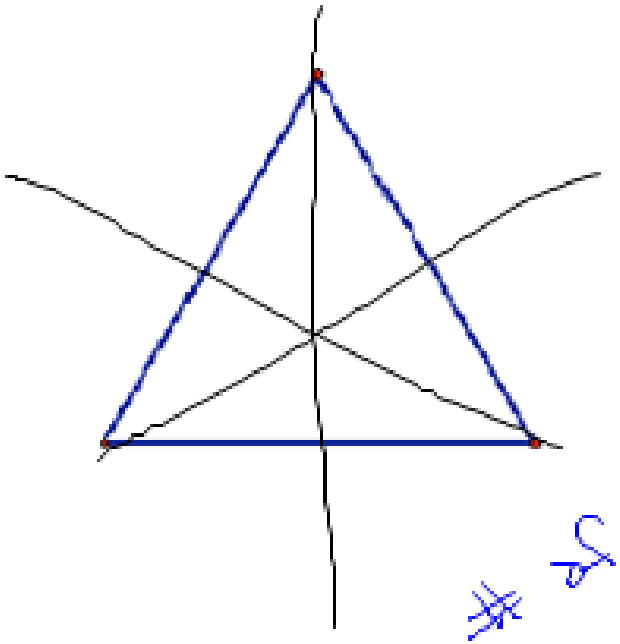
A Solidify Understanding Task

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.

For each of the following polygons, describe the rotations and reflections that carry it onto itself.

1. **An equilateral triangle**



lines of symmetry

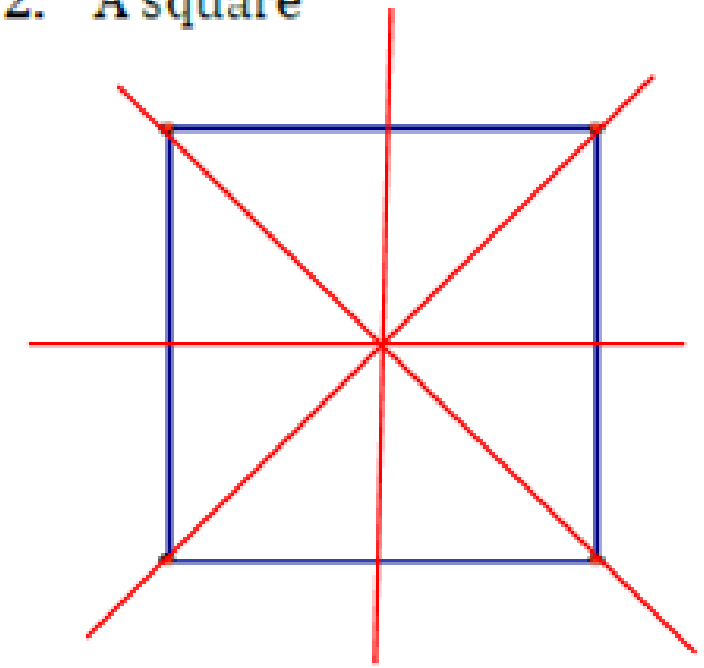
3: from each vertex to the midpt of the opp. side.

Rotational Symmetry

** n sides: $\frac{360}{n} = \frac{360}{3} = 120°$

For each of the following polygons, describe the rotations and reflections that carry it onto itself.

2. A square



lines of symmetry

2: from mdpt of opp sides.

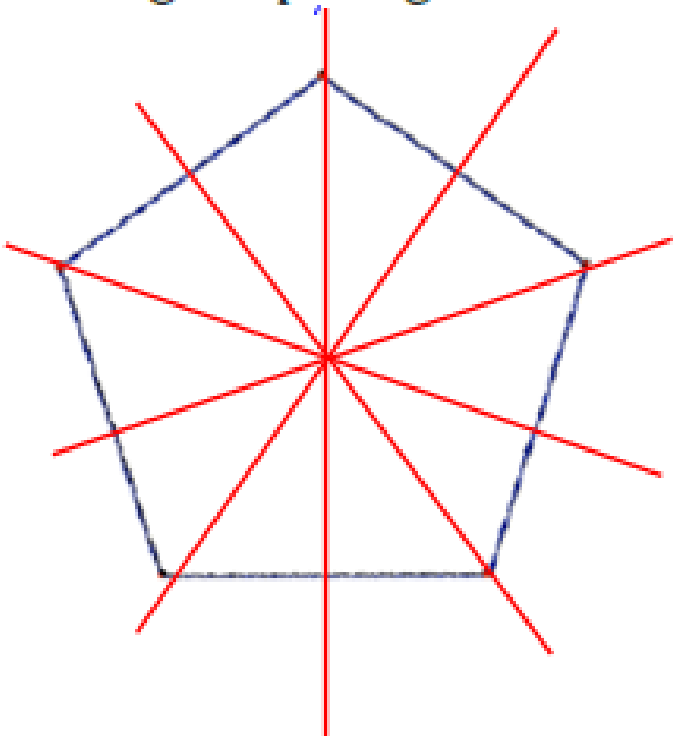
2: Diagonals.

Rotational symmetry

$\frac{360}{4} = 90^\circ$

For each of the following polygons, describe the rotations and reflections that carry it onto itself.

3. A regular pentagon



Lines of Symmetry

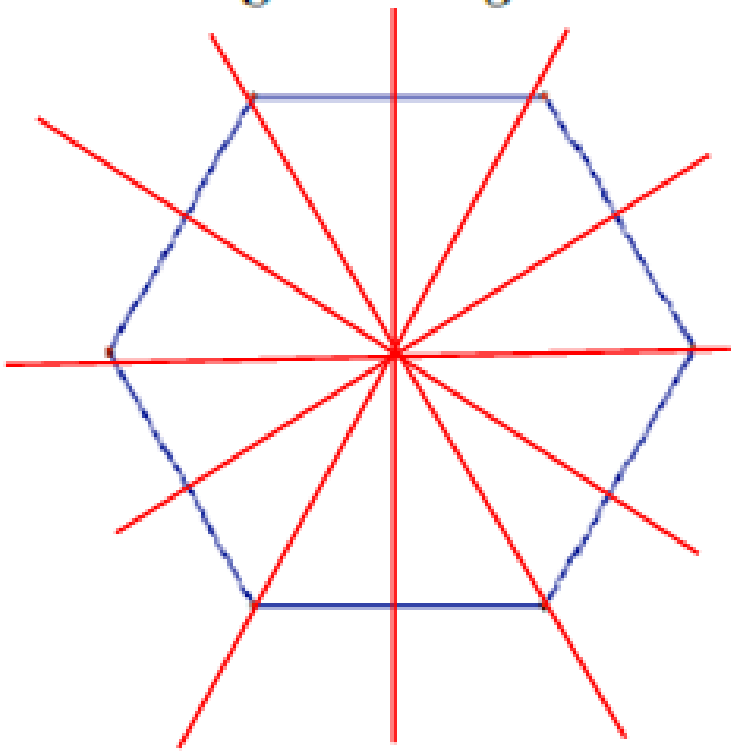
5: from each vertex to the mdpt of the opp side.

Rotational Symmetry

$\frac{360}{5} = 72°$

For each of the following polygons, describe the rotations and reflections that carry it onto itself.

4. A regular hexagon



lines of symmetry

3: diagonals connecting opp. vertices.

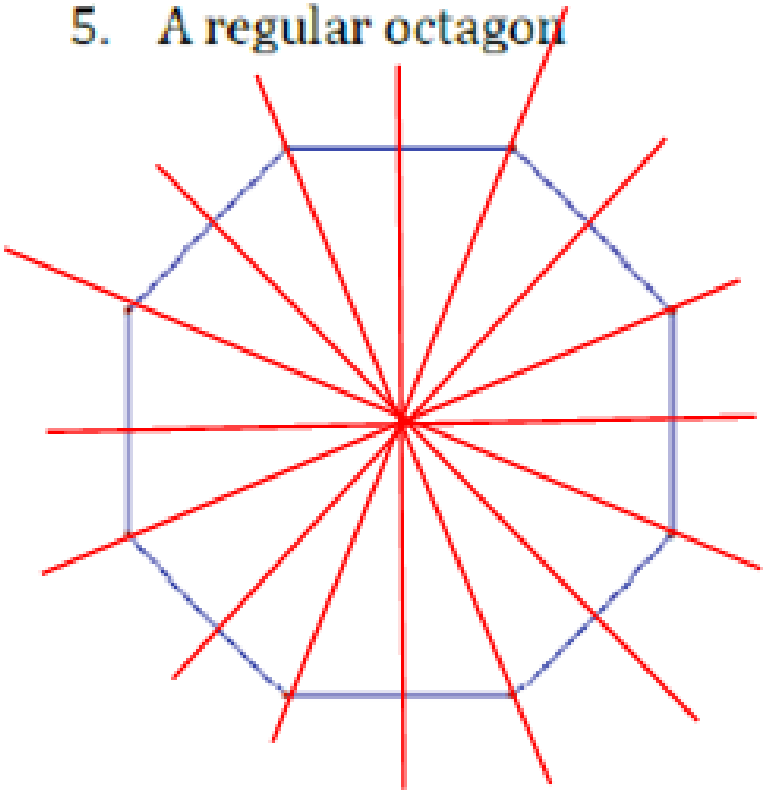
3: Connecting mdpt of opp. sides.

Rotational Symmetry

$\frac{360}{6} = 60°$

For each of the following polygons, describe the rotations and reflections that carry it onto itself.

5. A regular octagon



lines of symmetry

4: diagonals connecting opp. vertices

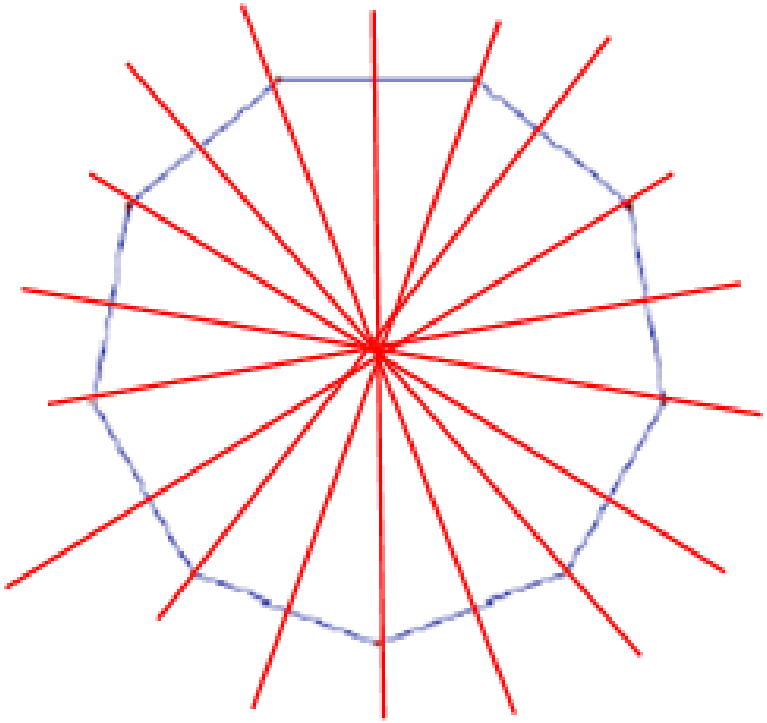
4: connecting mdpts of opp sides.

Rotational Symmetry

$\frac{360}{8} = 45°$

For each of the following polygons, describe the rotations and reflections that carry it onto itself.

6. **A regular nonagon**



lines of symmetry

9: from each vertex to the midpoint on the opposite side.

Rotational Symmetry

$\frac{360}{9} = 40^{\circ}$

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

Odd number of sides means the lines of symmetry will all be vertex to midpoint

even number of sides means that the lines of symmetry will be both vertex to vertex and midpoint to midpoint.

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

$\frac{360}{n}$ ← # of sides