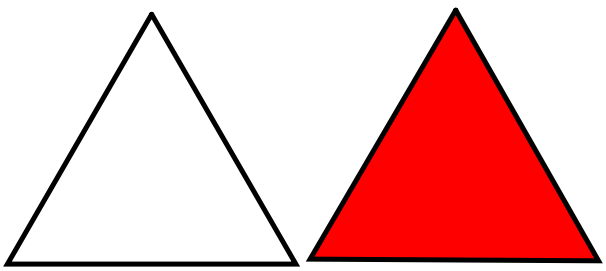
Section 7.6 Rotations and Rotational Symmetry

Rotational Symmetry

A figure has rotational symmetry if it can be turned around its center to match itself in less than a 360^{o} turn.



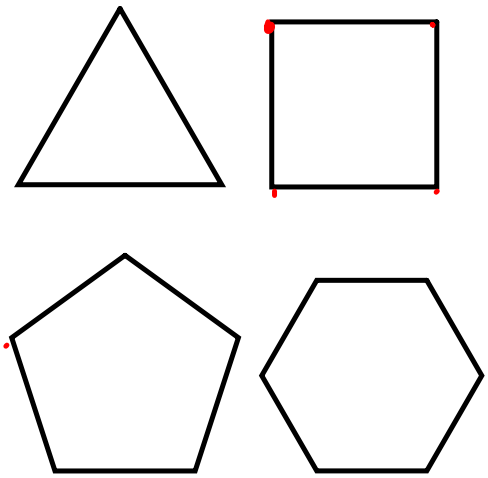
The number of times in one complete turn
that a figure matches itself is referred to as:

the order of rotational symmetry
(triangle has an order of 3)

OR

the degree of rotational symmetry
(triangle has a degree of 3)

Use the drawings below to help you determine the order or degree of rotational symmetry for each of the regular polygons.



Number of Sides	Degree or Order of Rotational Symmetry
3	3
4	4
5	5
6	6
n	n

Make a general statement describing the relationship

In regular polygons the number of sides is the same as the order of rotational symmetry.

Angle of Rotation Symmetry

the minimum angle required for a shape to rotate and coincide with itself

$$\frac{360^{o}}{\text{the order of rotation}}$$

Polygon Summary

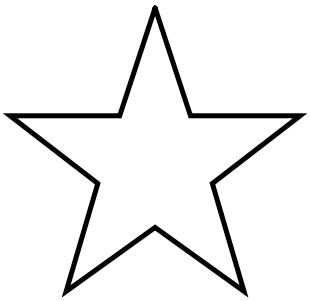
Number of Sides	Degree or Order of Rotational Symmetry	Angle of Rotation Symmetry
3	3	$\frac{360}{3} = 120°$
4	4	$360 \div 4 = 90°$
5	5	$360 \div 5 = 72°$
6	6	$360 \div 6 = 60°$

Try these!

A) 

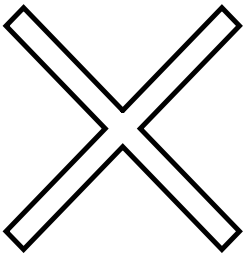
Order of Rotational Symmetry 2

Angle of Rotational Symmetry 180°

B) 

Order of Rotational Symmetry 5

Angle of Rotational Symmetry 72°

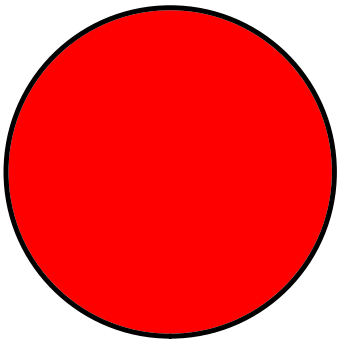
C) 

Order of Rotational Symmetry 4

Angle of Rotational Symmetry 90°

What do you think the order of symmetry is for a circle?

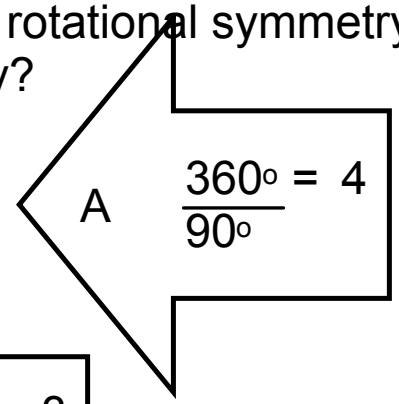
Infinite



What if you know the angle of rotation symmetry and you are asked to find the order of rotational symmetry ?

Examples:
What is the order of rotational symmetry for each angle of rotation symmetry?

A) 90^o



B) 120^o