

## Rotation Symmetry and 2-D Shapes

If you can rotate a 2-D shape less than one full turn and it still looks the same, the shape has rotation symmetry.

Let's explore what we mean by this.

All regular polygons have rotation symmetry. The number of times a shape can be rotated within  $360^\circ$  (one full turn) and still look the same is called the *order of rotation symmetry*. When determining if a shape has rotation symmetry, we rotate it about its centre.

Cut out or trace the shapes below and rotate them about their centre to see for yourself.

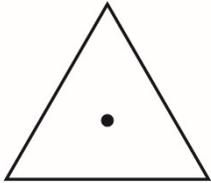
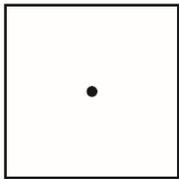
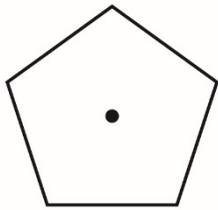
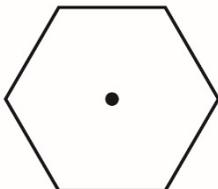
The order of rotation symmetry of a regular polygon is equal to the number of sides or angles!

A shape has *rotation symmetry* if it coincides with itself in less than one full turn about the centre of the shape.

The number of times a shape coincides with itself within a rotation of  $360^\circ$ , including either the beginning or ending position, is its *order of rotation symmetry*.

## Rotation Symmetry and 2-D Shapes(cont'd)

Fill in the missing numbers.

<p>An equilateral triangle has 3 equal sides and 3 equal angles.</p> <p>In one full turn about its centre, an equilateral triangle coincides with itself (looks the same) 3 times. So, an equilateral triangle has <i>order of rotation symmetry</i> 3.</p>	
<p>A square has ___ equal sides and ___ equal angles.</p> <p>In one full turn about its centre, a square coincides with itself (looks the same) ___ times. So, a square has <i>order of rotation symmetry</i> ___.</p>	
<p>A regular pentagon has ___ equal sides and ___ equal angles.</p> <p>In one full turn about its centre, a regular pentagon coincides with itself (looks the same) ___ times. So, a regular pentagon has <i>order of rotation symmetry</i> ___.</p>	
<p>A regular hexagon has ___ equal sides and ___ equal angles.</p> <p>In one full turn about its centre, a regular hexagon coincides with itself (looks the same) ___ times. So, a regular hexagon has <i>order of rotation symmetry</i> ___.</p>	

Name \_\_\_\_\_ Date \_\_\_\_\_

Geometry  
Unit 1 Line Master 6b

## Rotation Symmetry and 2-D Shapes(cont'd)

Repeat for a regular polygon of your choice.

A \_\_\_\_\_ has \_\_\_\_ equal sides and  
\_\_\_\_ equal angles.

In one full turn about its centre, a  
\_\_\_\_\_ coincides with itself (looks the  
same) \_\_\_\_\_ times. So, a \_\_\_\_\_ has  
*order of rotation symmetry* \_\_\_\_\_.

Draw the polygon  
here with the  
centre marked.

On Line Master 7, we will use this information to write code  
to model rotation symmetry.