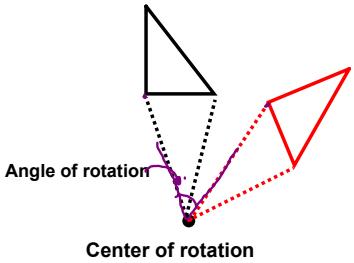
9.3 Rotations

Rotation
Transformation that turns every point of a preimage through a specified angle and direction about a fixed point.



Center of Rotation
The fixed point

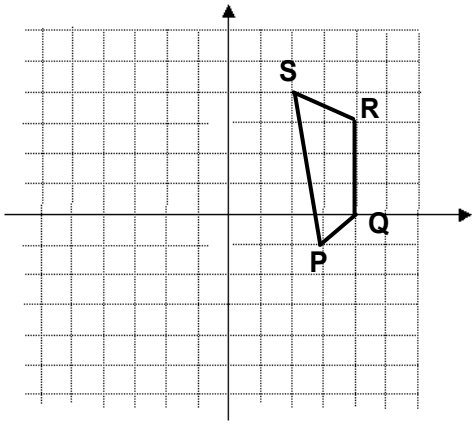
Angle of Rotation
When rays drawn from the center of rotation to a point and its image form an angle.

A rotation is an isometry
What does that mean??

Using graph paper, compass and protractor

A quadrilateral has vertices
P(3,-1), Q(4,0), R(4,3), S(2,4).

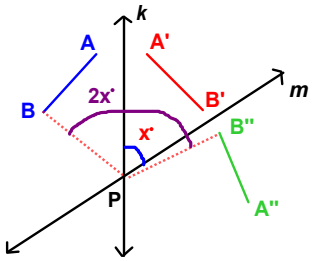
Rotate PQRS 180° counterclockwise about (0,0) and name the coordinates of the new vertices.



9.3 rotations notes - Geometry

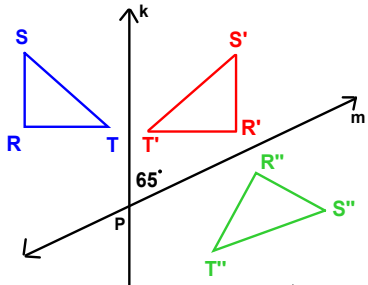
Lines *k* and *m* intersect at point P.
A reflection in *k* followed by a reflection in *m* is a rotation about point P.

The angle of rotation is $2x^\circ$, where x° is the measure of the acute or right angle form by *k* and *m*.



Corollary 9.1

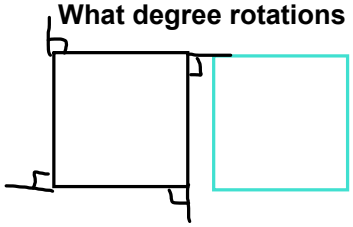
Reflecting an image successively in two perpendicular lines results in a 180° rotation.



Rotation : Clockwise 130°

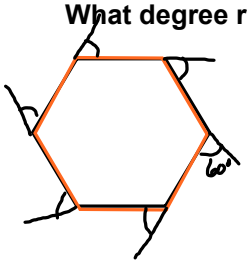
Describe the transformation that maps △RST to △R"S"T".

What degree rotations map a square onto itself?



90°
180°
270° . . .

What degree rotations map a hexagon onto itself?



6|360

60°
120°
180° ...

Order: 6
Mag: 60°

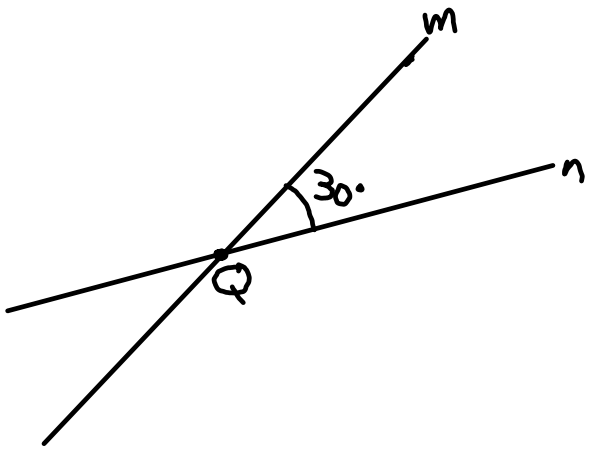
Rotational Symmetry

Mapping a figure onto itself by a rotation of 180° or less.

Order of rotational symmetry: The number of rotations of less than 360° that produce an image indistinguishable from the original.

Magnitude of rotational symmetry: The degree of actual rotation for each symmetrical mapping.

Lines *m* and *n* intersect at Q to form a 30˚ angle.
If a pentagon is reflected in *m*, then in *n* about point Q, what is the angle of rotation of the pentagon?



Double Reflection

2(30)

60° Rotation

Homework #59

p. 514 15, 17, 27-31, 39

& Practice Worksheet