

SYMMETRY

CLASS VII

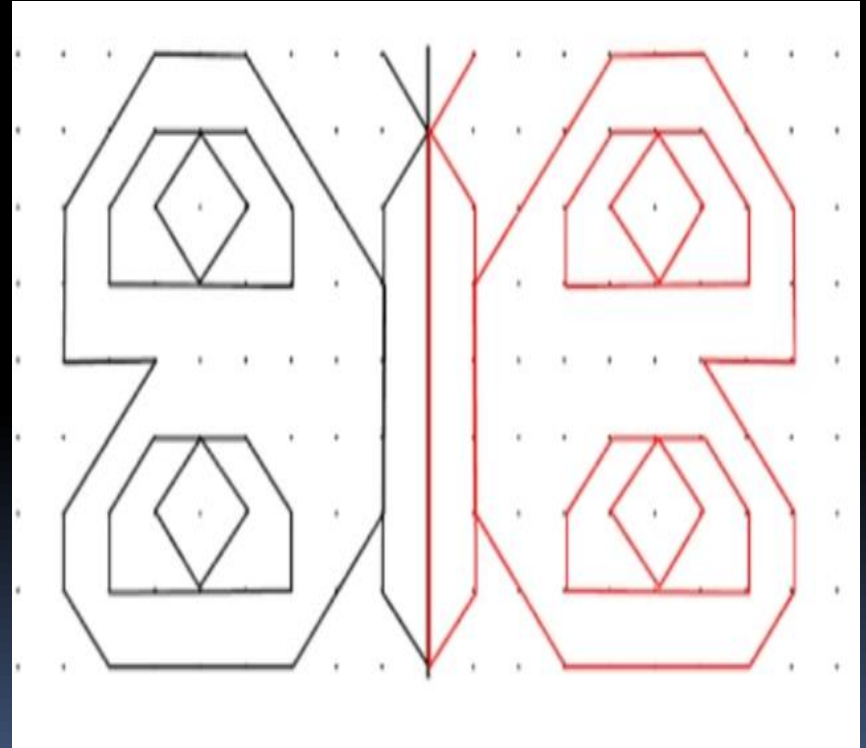


LINE SYMMETRY

Meaning

- If a shape can be folded in half in such a way that one half fits exactly over the other, then we say that the shape has got line symmetry.

Example

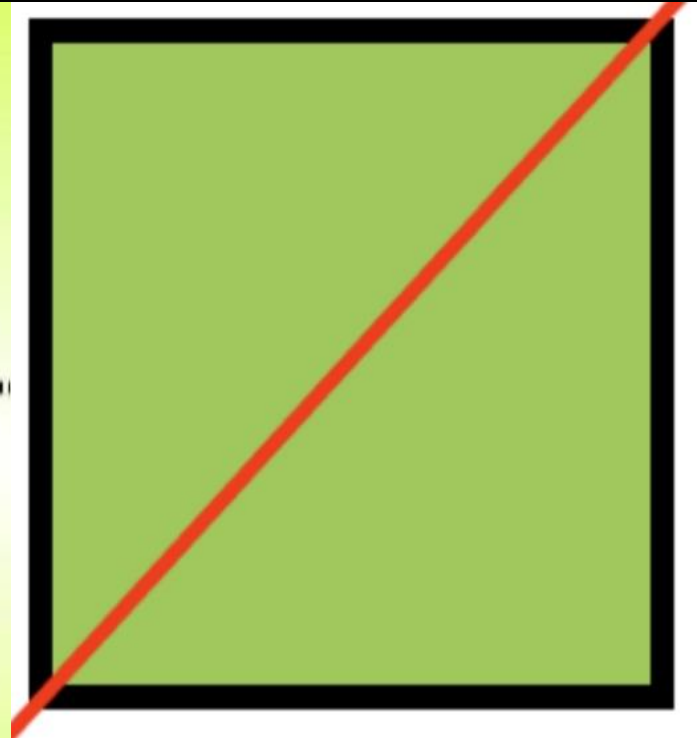
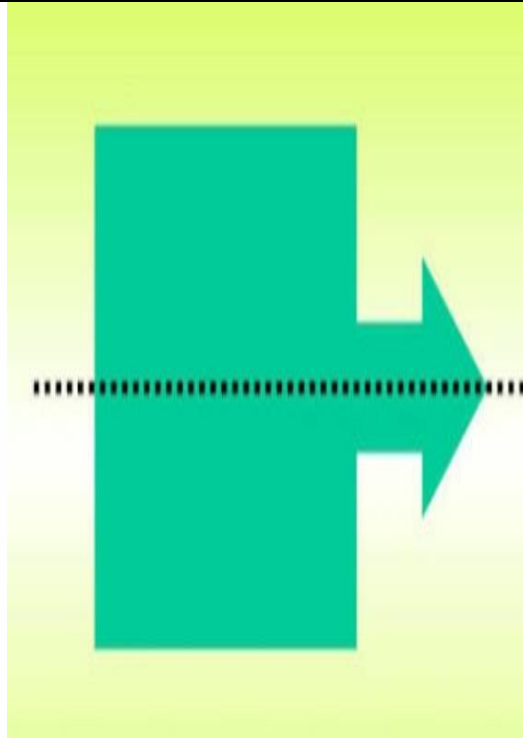
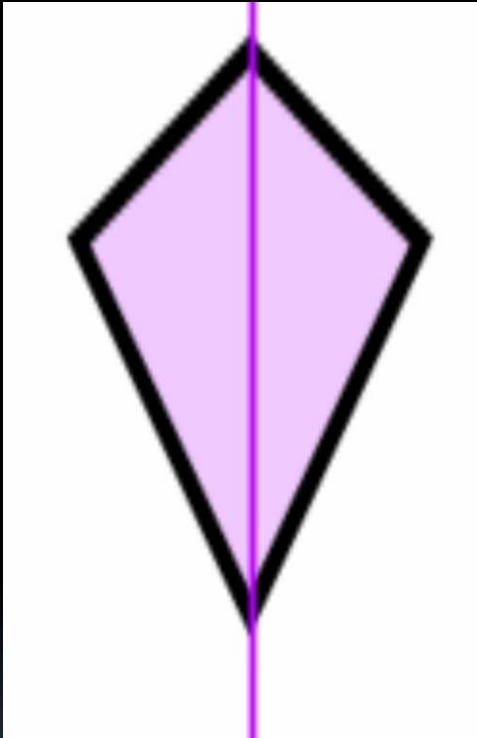


LINE OF SYMMETRY

- A figure has a line of symmetry, if there is a line about which the figure may be folded so that the two parts of the figure will coincide.
- The fold is called the line of symmetry.



TYPES OF LINES OF SYMMETRY



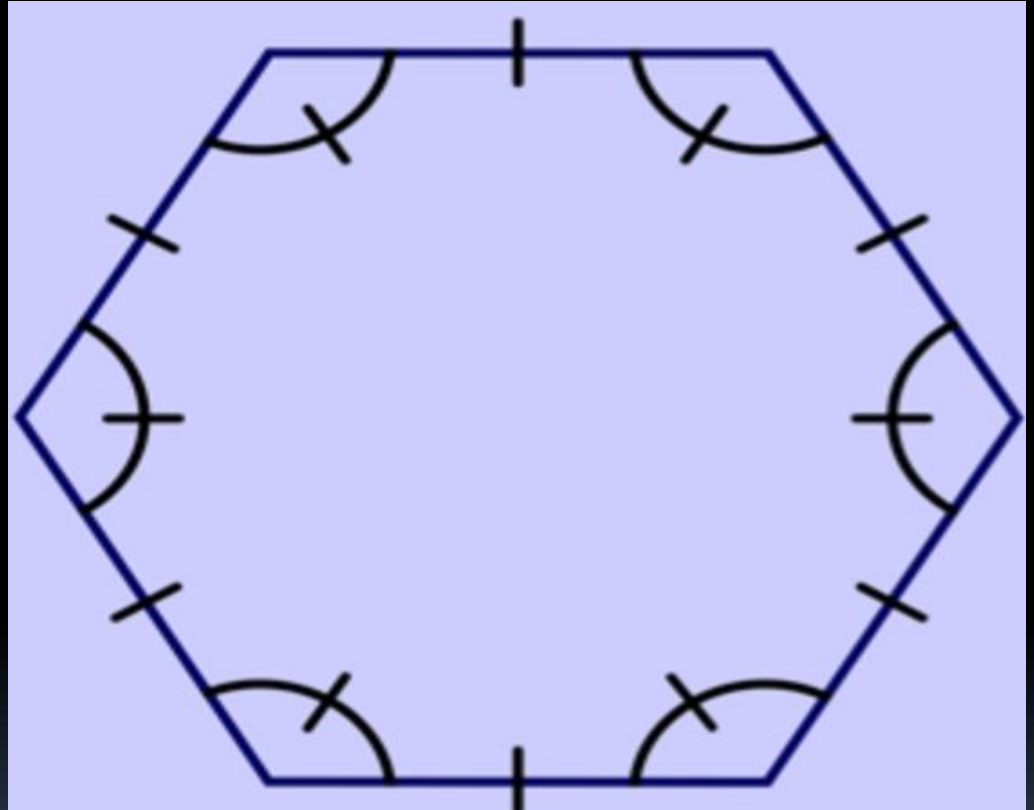
VERTICAL

HORIZONTAL

DIAGONAL

REGULAR POLYGONS

- Regular polygons have equal sides and equal angles.
- Example- Regular Hexagon



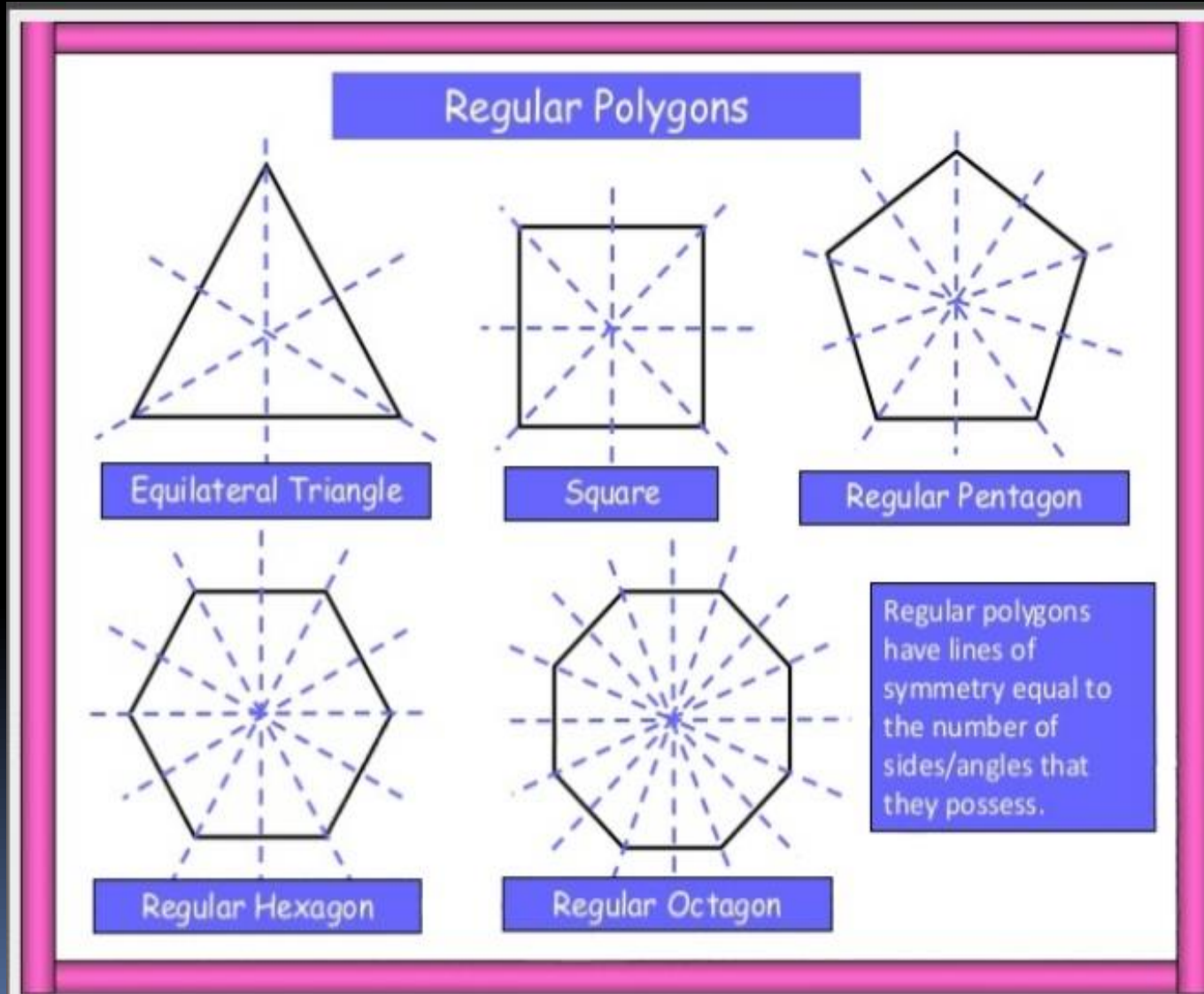
Regular Hexagon

LINEs OF SYMMETRY IN A REGULAR POLYGON

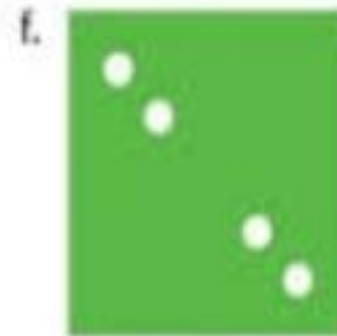
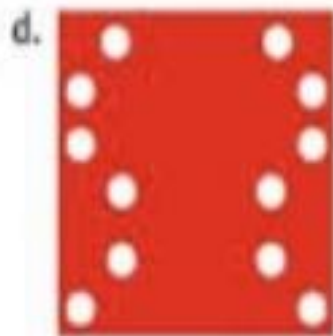
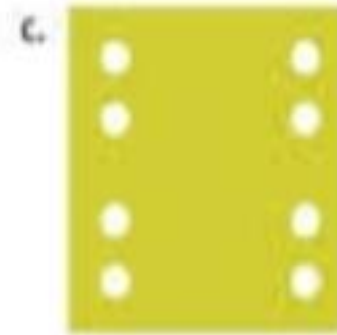
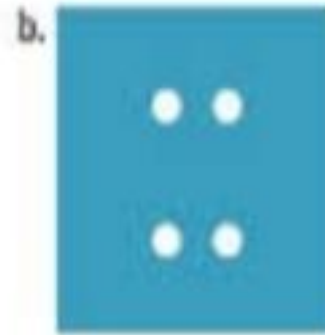
The number of lines of symmetry in a regular polygon is equal to its number of sides.

Regular Polygon	Number of sides	Number of lines of symmetry
Equilateral Triangle	3	3
Square	4	4
Regular Pentagon	5	5
Regular Hexagon	6	6

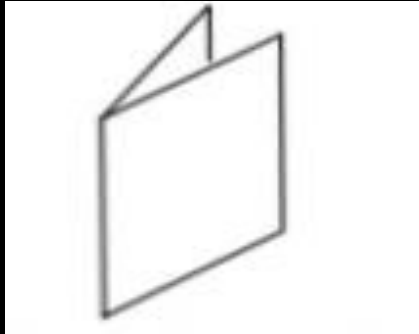
LINES OF SYMMETRY IN REGULAR POLYGONS



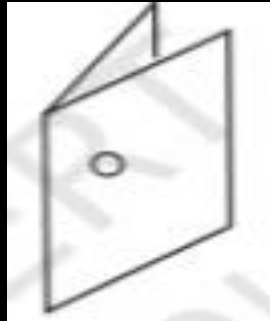
PUNCHED PATTERNS



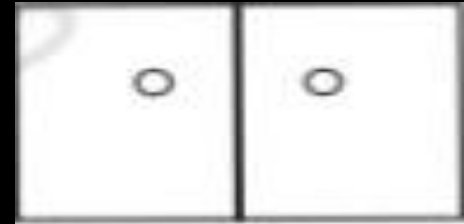
PUNCHING THE FOLDED SHEET - ACTIVITY



Fold a sheet
in two halves

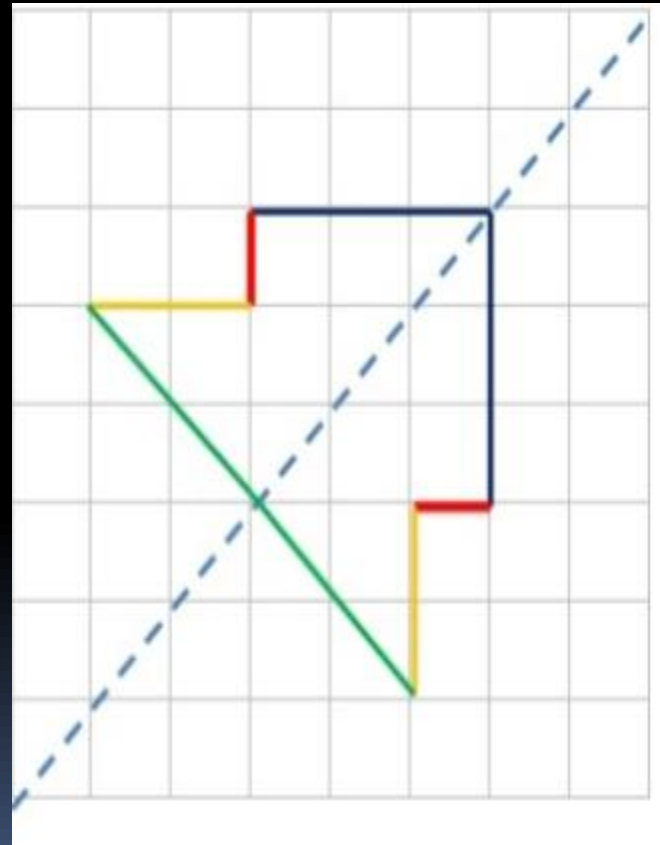
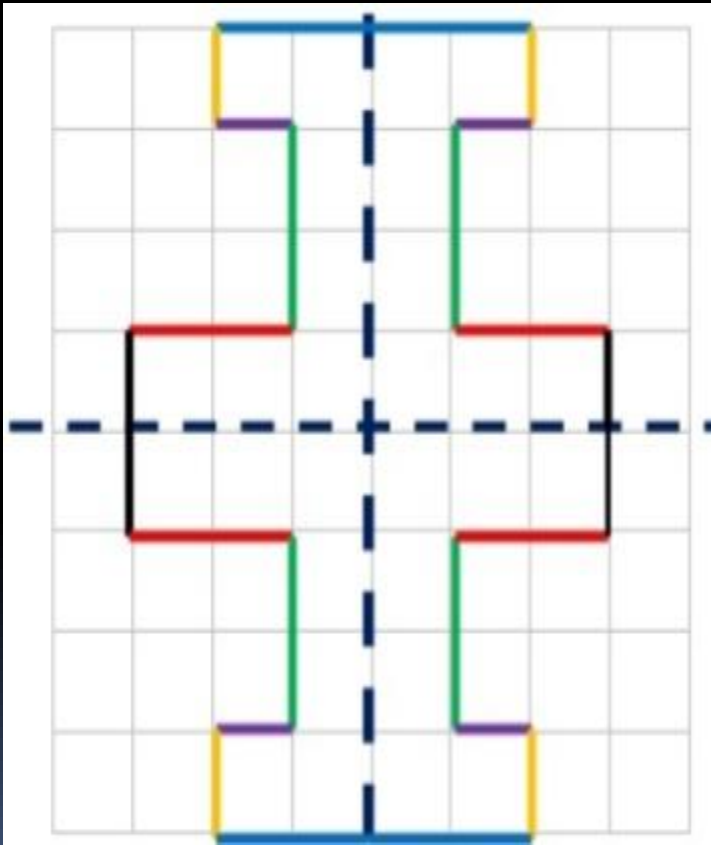


Punch a hole



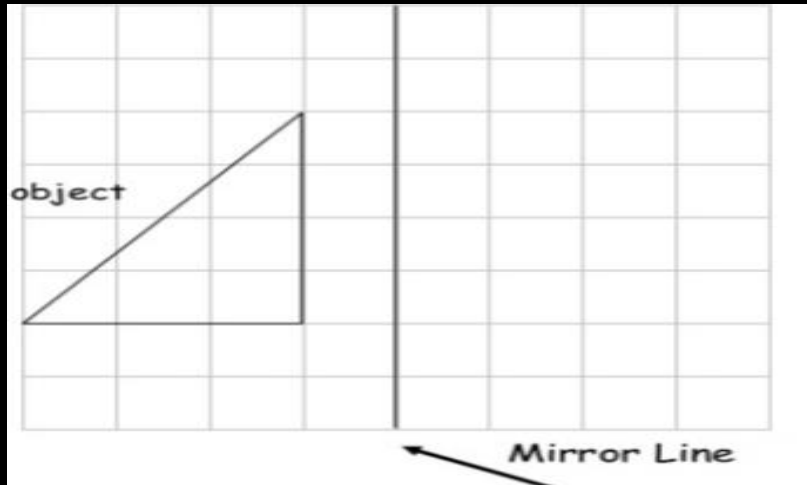
Two holes will be
formed after punching
the folded sheet.

MIRROR REFLECTION

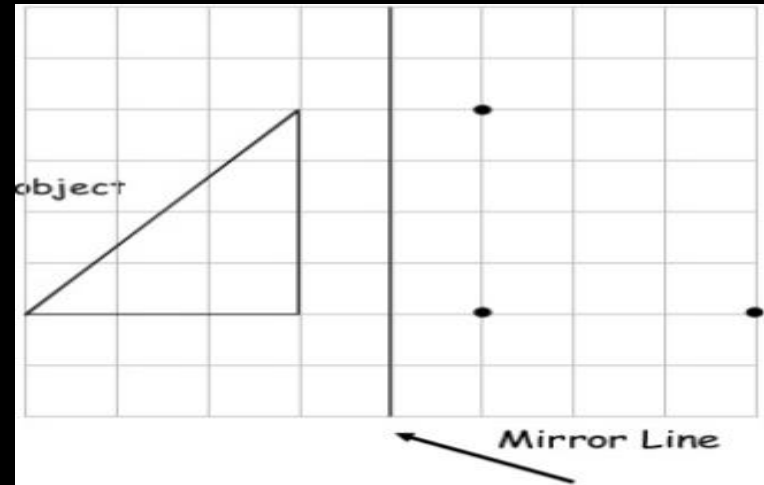


MIRROR REFLECTION - ACTIVITY

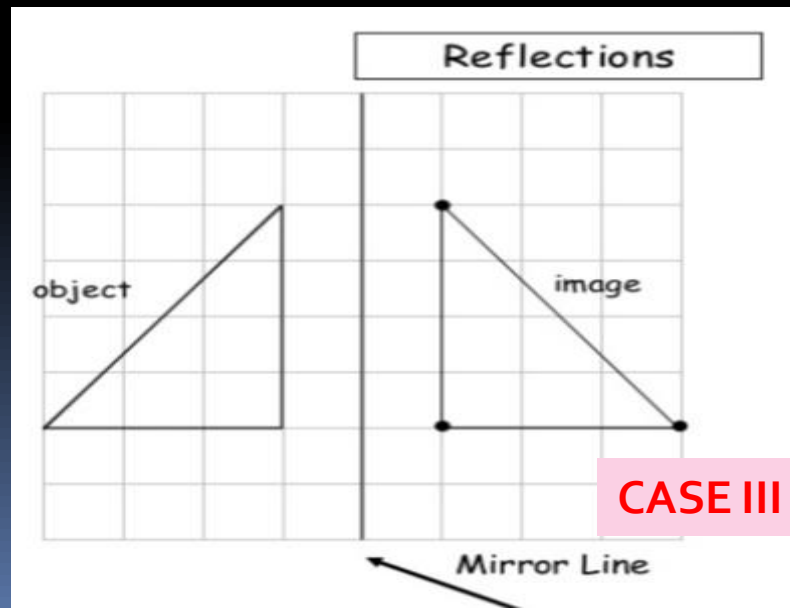
(To draw mirror image of the given figure)



CASE I

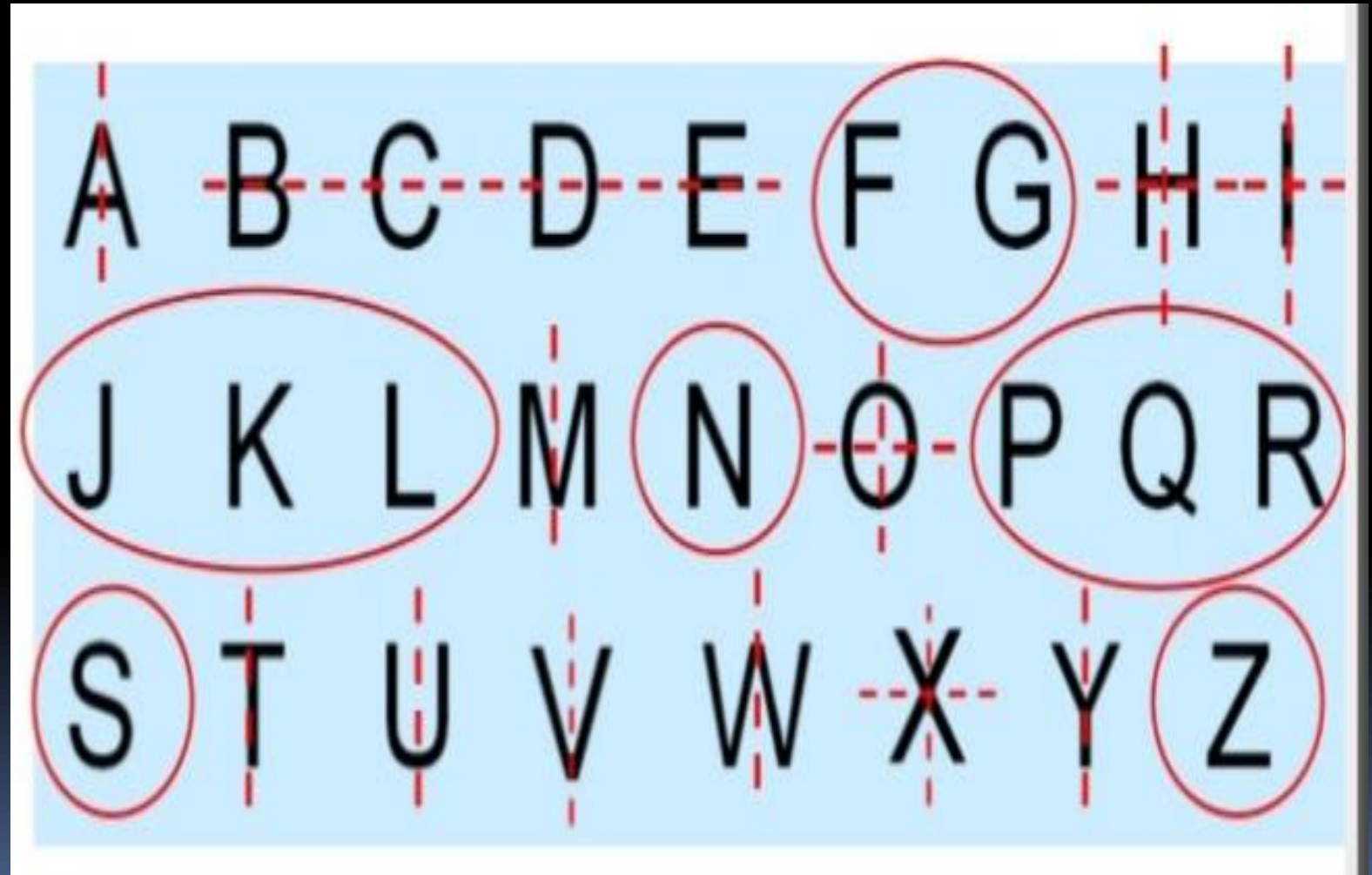


CASE II

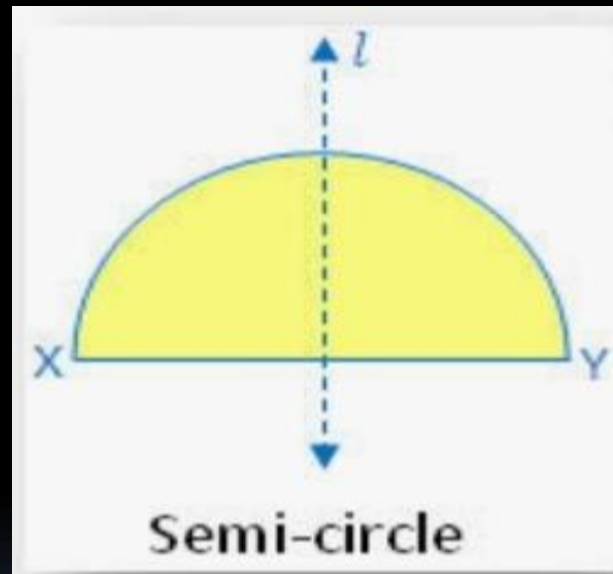
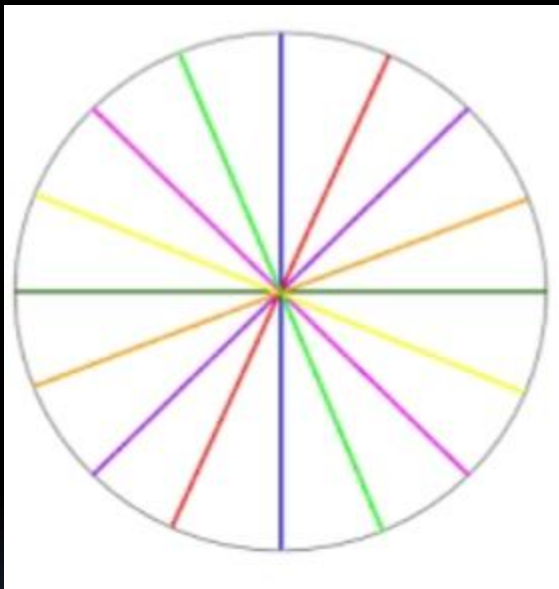


CASE III

LINES OF SYMMETRY IN ALPHABETS



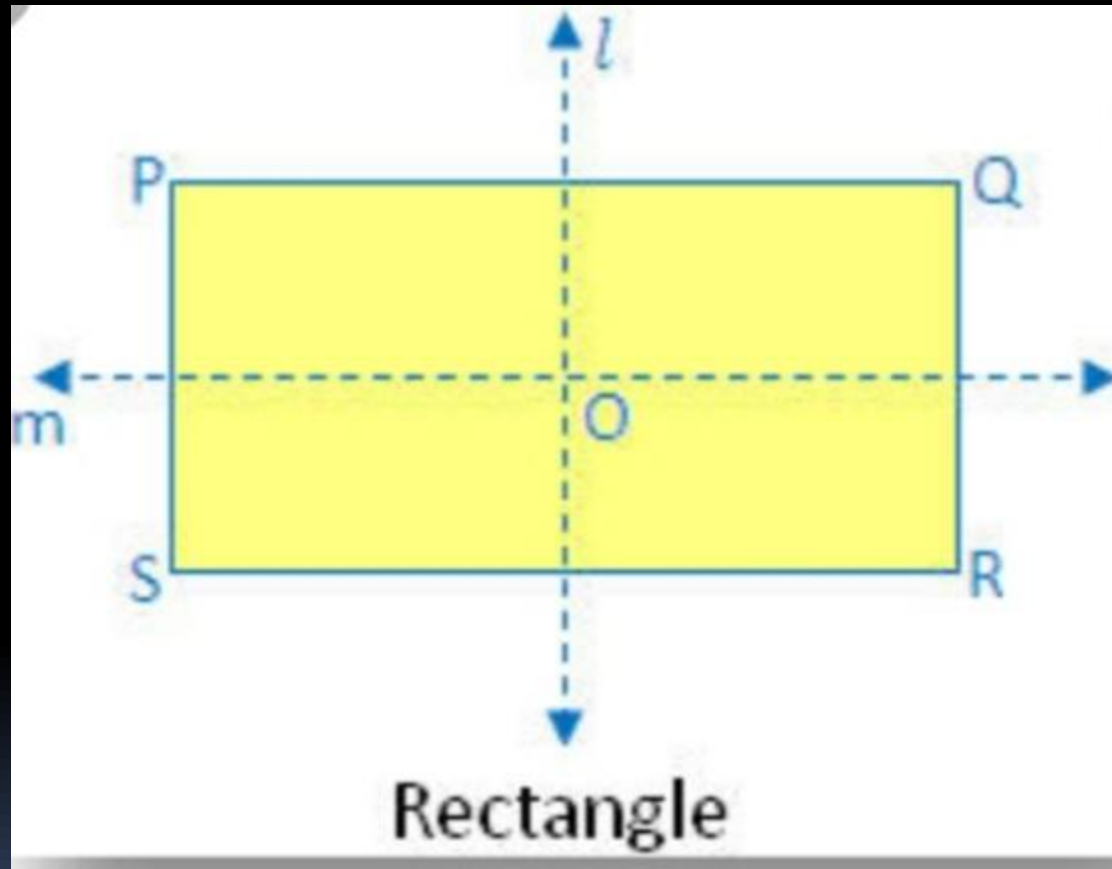
SYMMETRY IN CIRCLE AND SEMI -CIRCLE



Circle has infinite number of lines of symmetry.
Semi Circle has one line of symmetry.

SYMMETRY IN POLYGONS

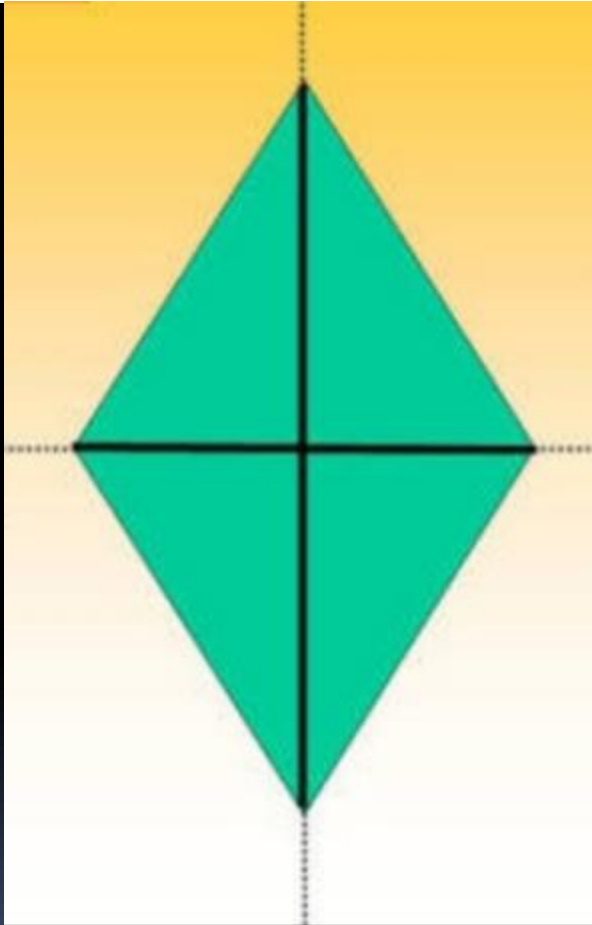
RECTANGLE



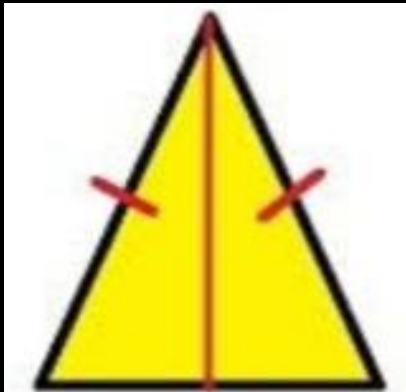
Rectangle has two lines of symmetry

RHOMBUS

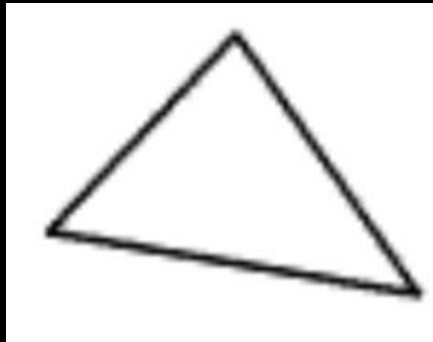
Rhombus
has two
lines of
symmetry



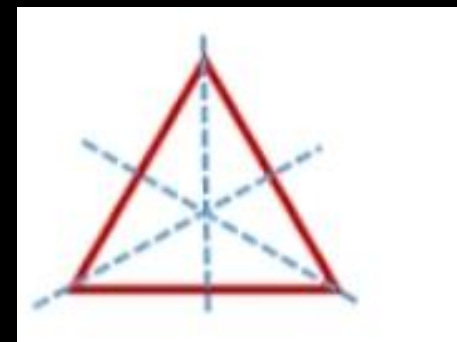
SYMMETRY IN TRIANGLES



Isosceles
triangle has
one line of
symmetry

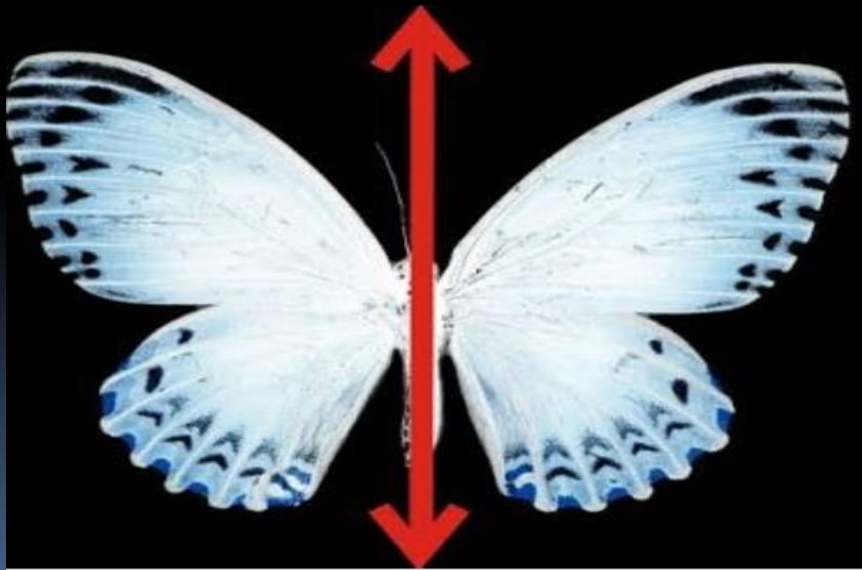
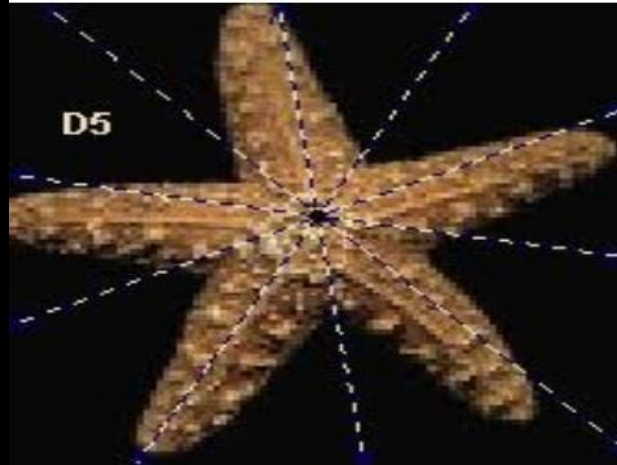


Scalene
triangle has
no line of
symmetry



Equilateral
triangle has
three lines of
symmetry

SYMMETRY IN NATURE

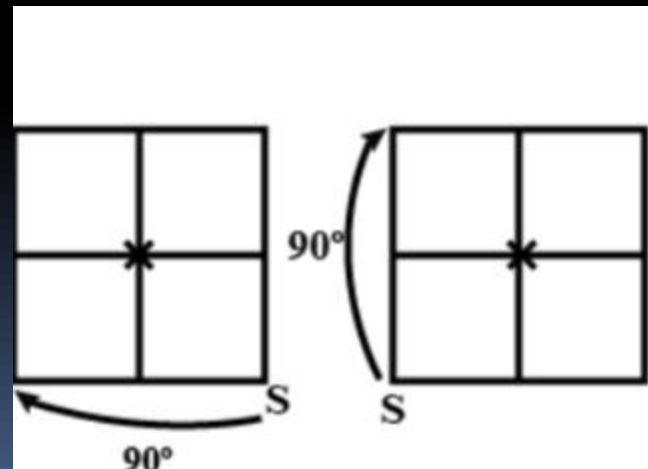
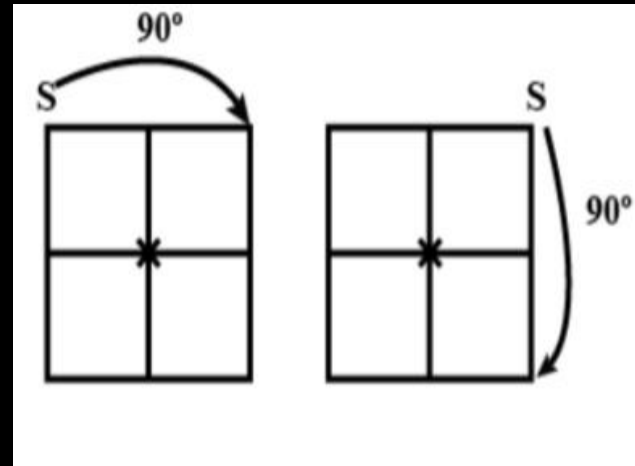


ROTATIONAL SYMMETRY

MEANING

EXAMPLE

- If, after a rotation by some angle, an object looks exactly the same, we say that it has rotational symmetry.
- For example – If we rotate a square by 90 degrees, it will look exactly the same as before.



ROTATIONAL SYMMETRY

ANGLE OF ROTATIONAL SYMMETRY

- On rotating the object, the angle by which the object looks exactly the same is called its angle of rotation.
- For example – Angle of rotation in an equilateral triangle is 120 degrees.

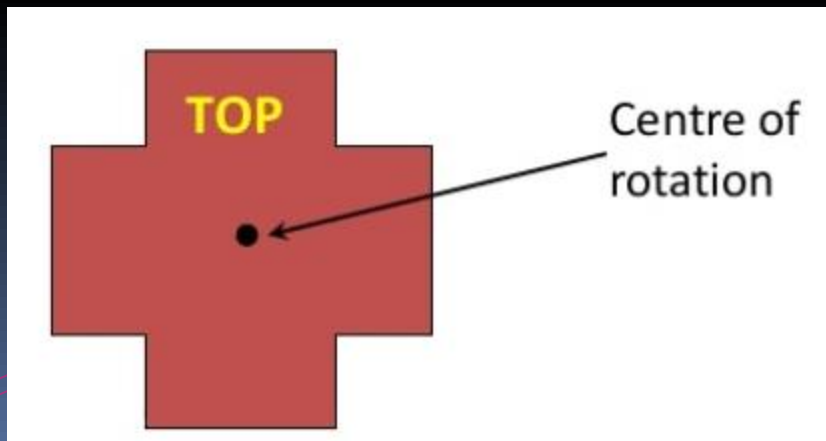
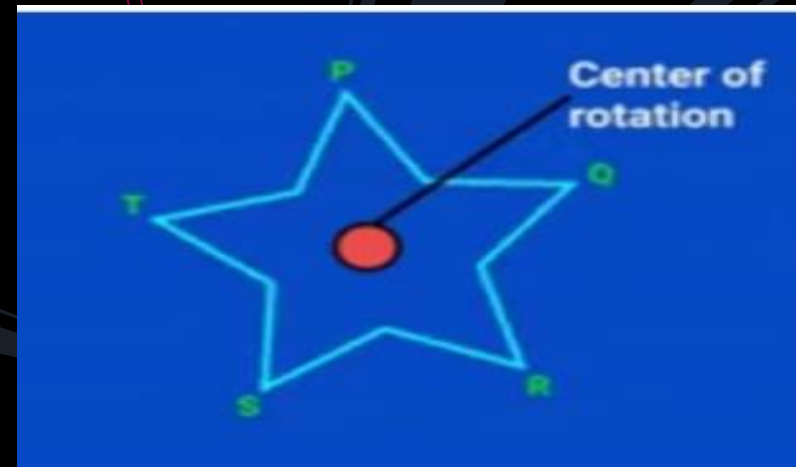
ORDER OF ROTATIONAL SYMMETRY

- In a complete turn of 360 degrees, the number of times an object looks exactly the same is called its order of rotational symmetry.
- Order of rotation
 $= 360 \div \text{Angle of rotation}$

CENTRE OF ROTATION IN ROTATIONAL SYMMETRY

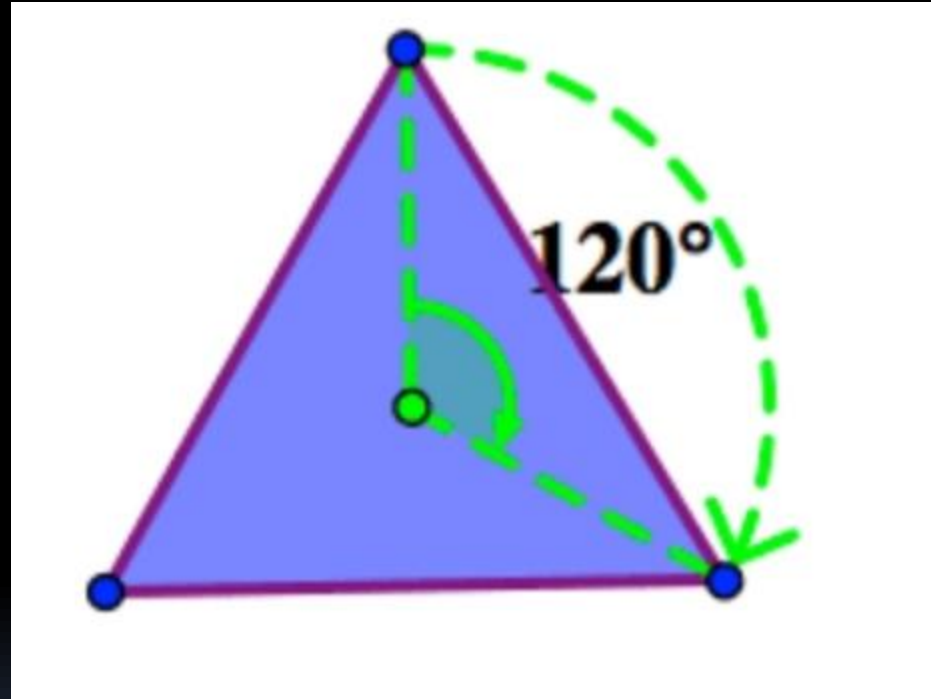
CENTRE OF ROTATION

A fixed point about which the figure is rotated.



ROTATIONAL SYMMETRY IN EQUILATERAL TRIANGLE

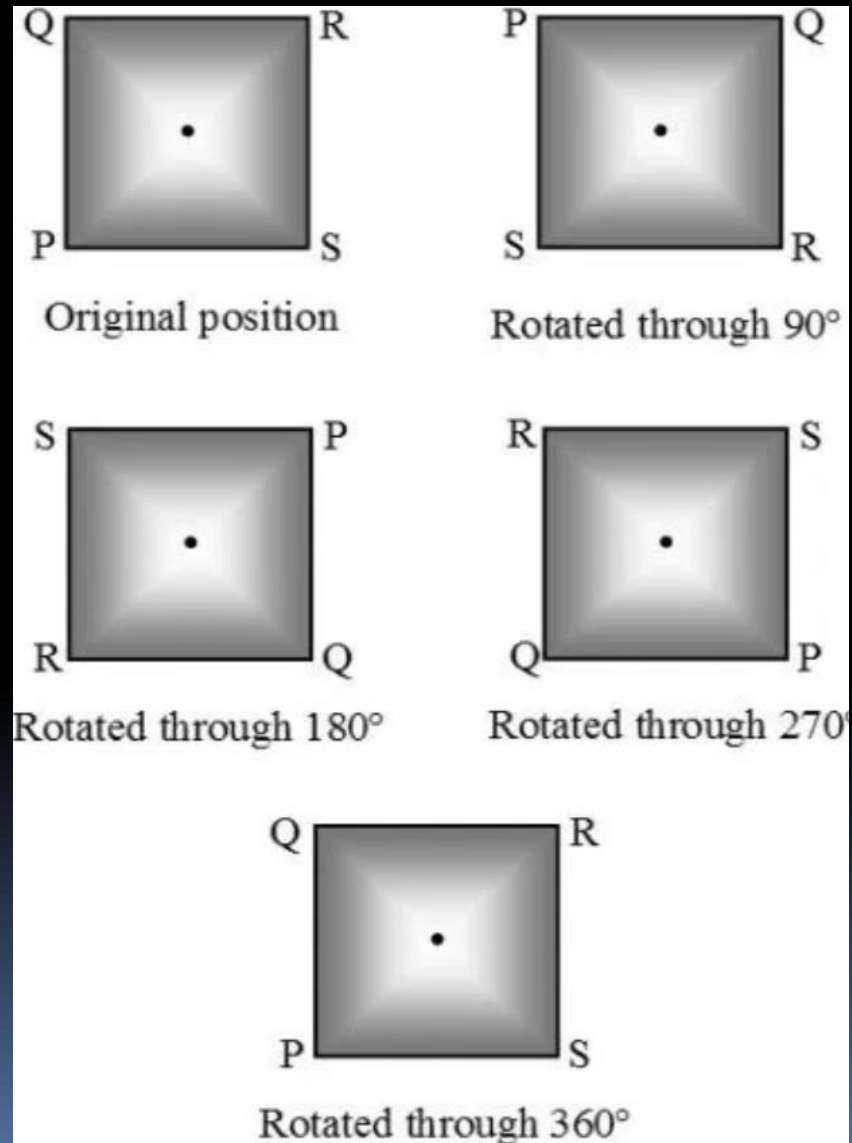
- Angle of rotation
= 120 degrees.
- Order of rotation
= $360 \div 120$
= 3



The triangle looks exactly the same if we rotate it by 120 degrees

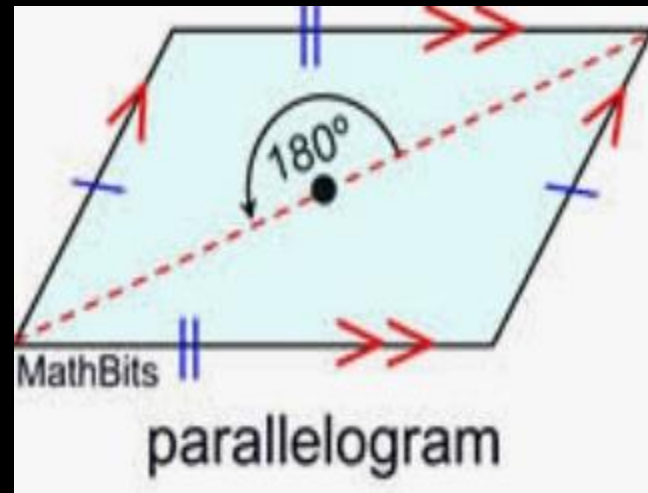
ROTATIONAL SYMMETRY IN SQUARE

- Angle of rotation
= 90 degrees.
- Order of rotation
= $360 \div 90$
= 4



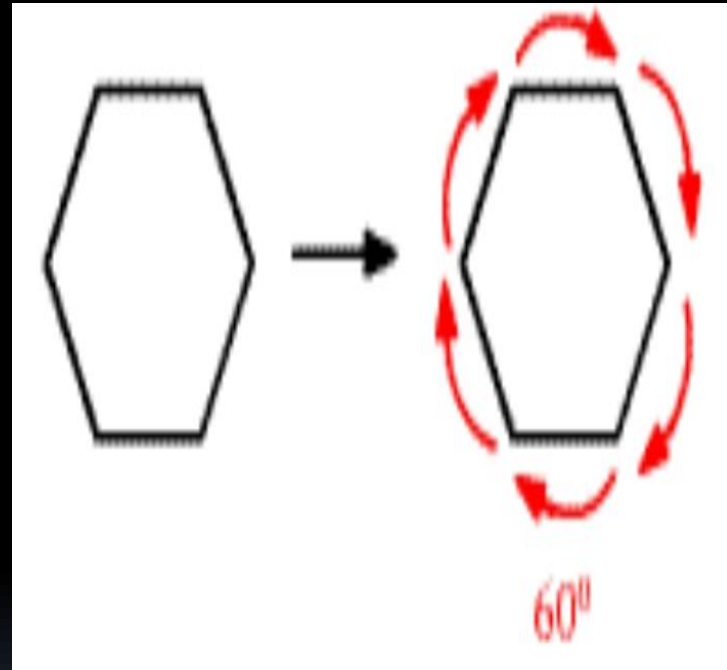
ROTATIONAL SYMMETRY IN PARALLELOGRAM

- Angle of rotation
= 180 degrees.
- Order of rotation
= $360 \div 180$
= 2



ROTATIONAL SYMMETRY IN REGULAR HEXAGON

- Angle of rotation
= 60 degrees.
- Order of rotation
= $360 \div 60$
= 6



SHAPE	ANGLE OF ROTATION	ORDER OF ROTATION
Square	90 degrees	4
Rectangle	180 degrees	2
Parallelogram	180 degrees	2
Rhombus	180 degrees	2
Regular Hexagon	60 degrees	6

SHAPE	ANGLE OF ROTATION	ORDER OF ROTATION
Circle	Any angle	Infinite
Semi-Circle	360 degrees	1
Regular Octagon	45 degrees	8
Equilateral Triangle	120 degrees	3
Regular Pentagon	72 degrees	5

ROTATIONAL SYMMETRY IN OBJECTS

