

Symmetrical Designs

A. Rotational Symmetry

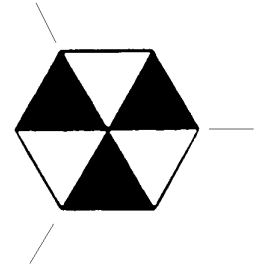
The design at the right has rotational symmetry.

It can be rotated 120° , 240° or 360° about its centerpoint to a position in which it looks identical to its original design.

The **angle of rotation** is the smallest angle (less than 360°) through which the design can be rotated to coincide with the original design.

The angle of rotation of this shape is 120° .

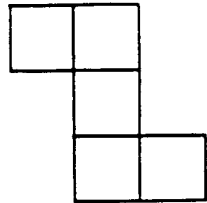
Note that the other rotation angles of this design are multiples of 120° .



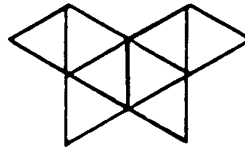
Determine the angle of rotation for each design below.

If the shape has no rotational symmetry, it has no angle of rotation less than 360° , so report "none."

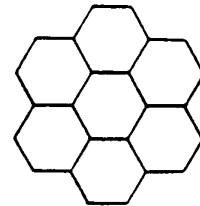
EXAMPLES:



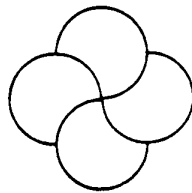
180°



none



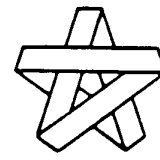
60°



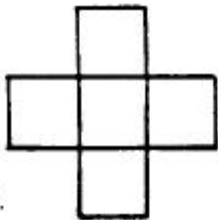
90°



72°



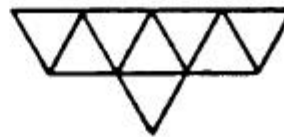
none



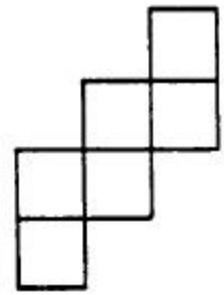
1.



2.



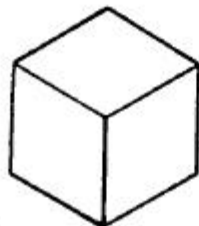
3.



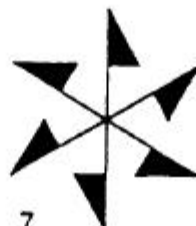
4.



5.



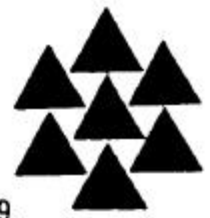
6.



7.



8.

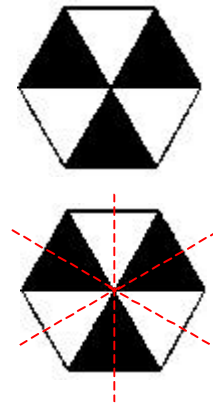


9.

B. Reflective Symmetry

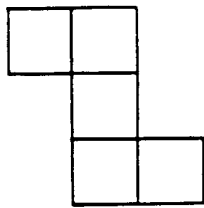
The design at the right has 3 lines of symmetry.

Each axis of symmetry divides the design into two pieces so that one side is the mirror image of the other.

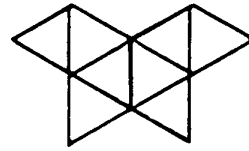


Determine how many lines of symmetry each figure has.
Draw them on the figure.

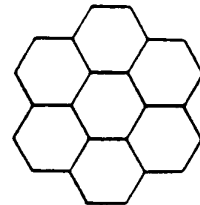
EXAMPLES:



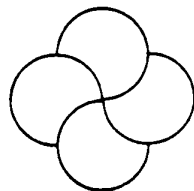
none



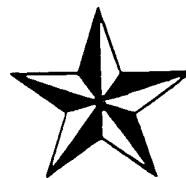
one



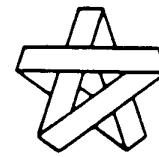
six



none



none



none

