**SYMMETRIES:** A symmetry is a rigid transformation of a figure onto itself.

For example, an equilateral triangle ABC may be:
- rotated 120° (so that A-B, B-C and C-A) \( [(A, B, C)] \)
- rotated 240° (A-C, B-A and C-B).
  
  (Examples of point symmetry or rotational symmetry)

The triangle may also be:
- reflected through the altitude from A ... A stays in place, B-C, C-B ... (A) (BC)
- reflected through the altitude from B \( [(B) (A, C)] \)
- reflected through the altitude from C. \( [(C) (A, B)] \)
  
  (Examples of line symmetry)

Together with the 360° rotational symmetry (which is tantamount to leaving the figure alone!), which every figure has, these symmetries form "the symmetry group of an equilateral triangle".

1. The letter A has line symmetry. Draw the line of reflection, or line of symmetry.
2. The letter B also has line symmetry. Check out these:
3. Do any of these letters have rotational symmetry?
   - A
   - B
   - C
   - D
   - E
   - F
   - G
   - H
   - I
   - J
   - K
   - L
   - M
   - N
   - O
   - P
   - Q
   - R
   - S
   - T
   - U
   - V
   - W
   - X
   - Y
   - Z

* A circle has infinitely many rotational symmetries; the letter O here is not a perfect circle.

4. Find all the symmetries of each of the following:
   a. isosceles triangle region
   b. scalene quadrilateral
   c. isosceles trapezoid region
   d. parallelogram region
   e. rhombus region
   f. square
   g. regular hexagon region
   h. circular region
   i. the figure at right

5. A line can be translated along its length. A plane. A frieze design.

6A. Add one square to this figure ...so that it will have one line & no rotational symmetry.
6B. ...so that it will have one rotational & no line symmetry.

Other creative solutions to #5&6 exist, but we show the most obvious here.