1. For each of the following designs given below, identify all the symmetries of the design.
2. Divide the line segment AB given below into seven equal parts by ruler and compass.

A ___________________________ B

3. Recall that two geometric figures are said to be similar if they have the same shape (i.e. corresponding elements are proportional). Determine whether the given pair of shapes given below are always, sometimes or never similar.

(a) two rectangles of equal area
(b) a regular pentagon and a golden triangle
(c) two obtuse golden triangles with different areas
(d) two isosceles triangles with same height
(e) two circles with different diameters
4. You are commissioned to construct an acute golden triangle using copper wire. If the total length of the wire is 8472 feet, what is the base of the largest golden triangle that you can construct? Draw a diagram to explain your answer (say, with 1 cm = 100 feet)
5. Three points given below lie on a circle but unfortunately the circle itself got erased. Reconstruct the circle (in other words, find the centre and the radius of the circle).

![Circle with three points](image)

Give a brief description of your method for finding the centre of the circle.

$8 + 2 = 10$
6. The image B is obtained from A by rotating A around a specific centre C and by a specific angle of $\theta$ degrees. Find the centre C and $\theta$, the angle of rotation. Give a brief description of your method.