ENGINEERING DRAWING
SKV 1021

GEOMETRY (2)

Agus Arsad, Azizul Azri Mustaffa



LEARNING OUTCOMES

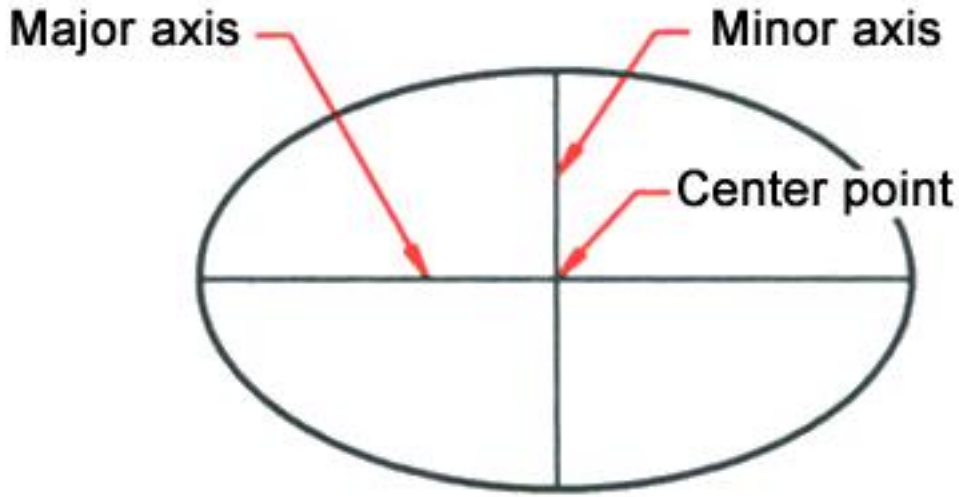
GEOMETRY

It is expected that students will be able to:

- Apply the techniques for drawing polygons & normal structures

TECHNIQUES FOR DRAWING ELLIPSE

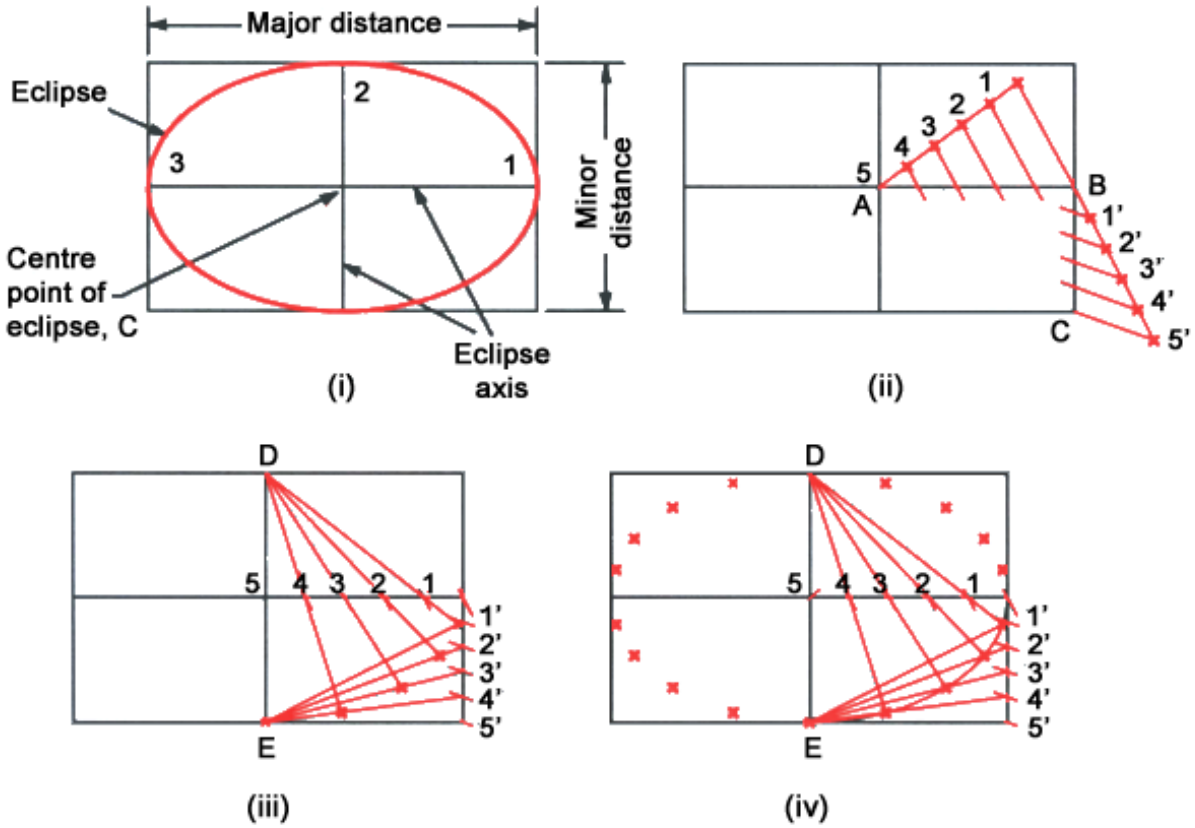
ELLIPSE



- Ellipse is a geometry built from combination of curves with 2 different axis known as major and minor axis

TECHNIQUES FOR DRAWING ELLIPSE (cont'd)

- **Rectangle distribution method**

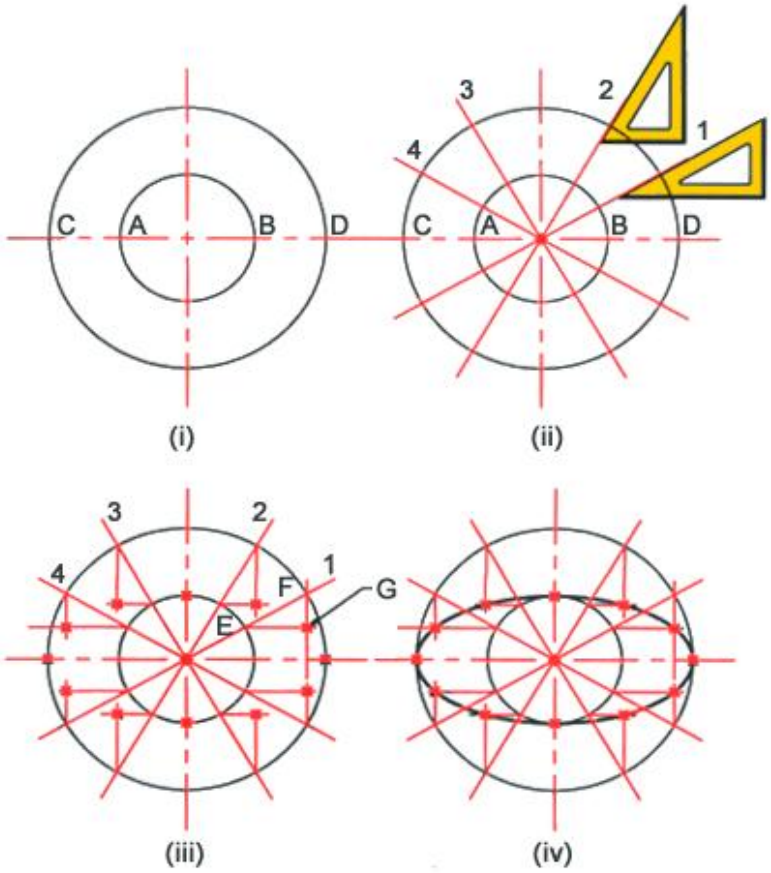


TECHNIQUES FOR DRAWING ELLIPSE (cont'd)

- **Steps using QCAD**
- Click on the *create line* button and click on the *create rectangles* button
- Draw a rectangle with the minor and major length and axis of the ellipse
- Divide major axis AB & minor axis BC to 5 parts (use the technique that you have learnt)
- Number all the parts as the figure
- From point D & E draw a line to intersect the same numbering
- Connect all the crossing points using the *arc function*. Repeat for other quarters.

TECHNIQUES FOR DRAWING ELLIPSE (cont'd)

- **Circular distribution method**

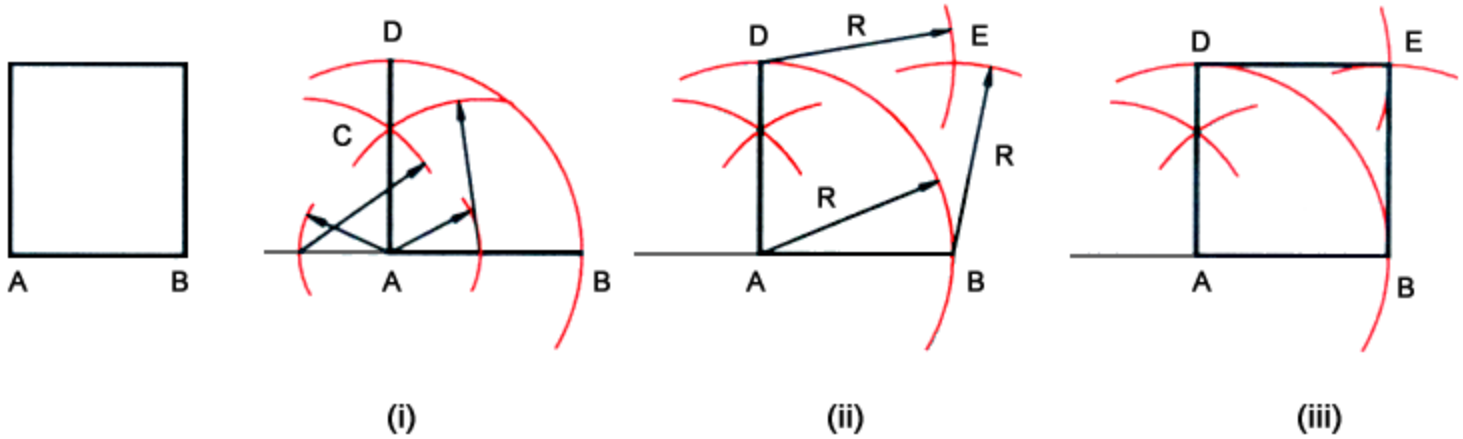


TECHNIQUES FOR DRAWING ELLIPSE (cont'd)

- **Steps using QCAD**
- Draw 2 circles at the same center with the diameter of the major & minor axis of the ellipse to be built
- Divide each quarter into 2 parts (same angle)
- Draw vertical & horizontal lines at the intersection of both circles with the dividing line
- Connect all the points of the intersection of both the vertical & horizontal lines

TECHNIQUES FOR DRAWING POLYGONS (cont'd)

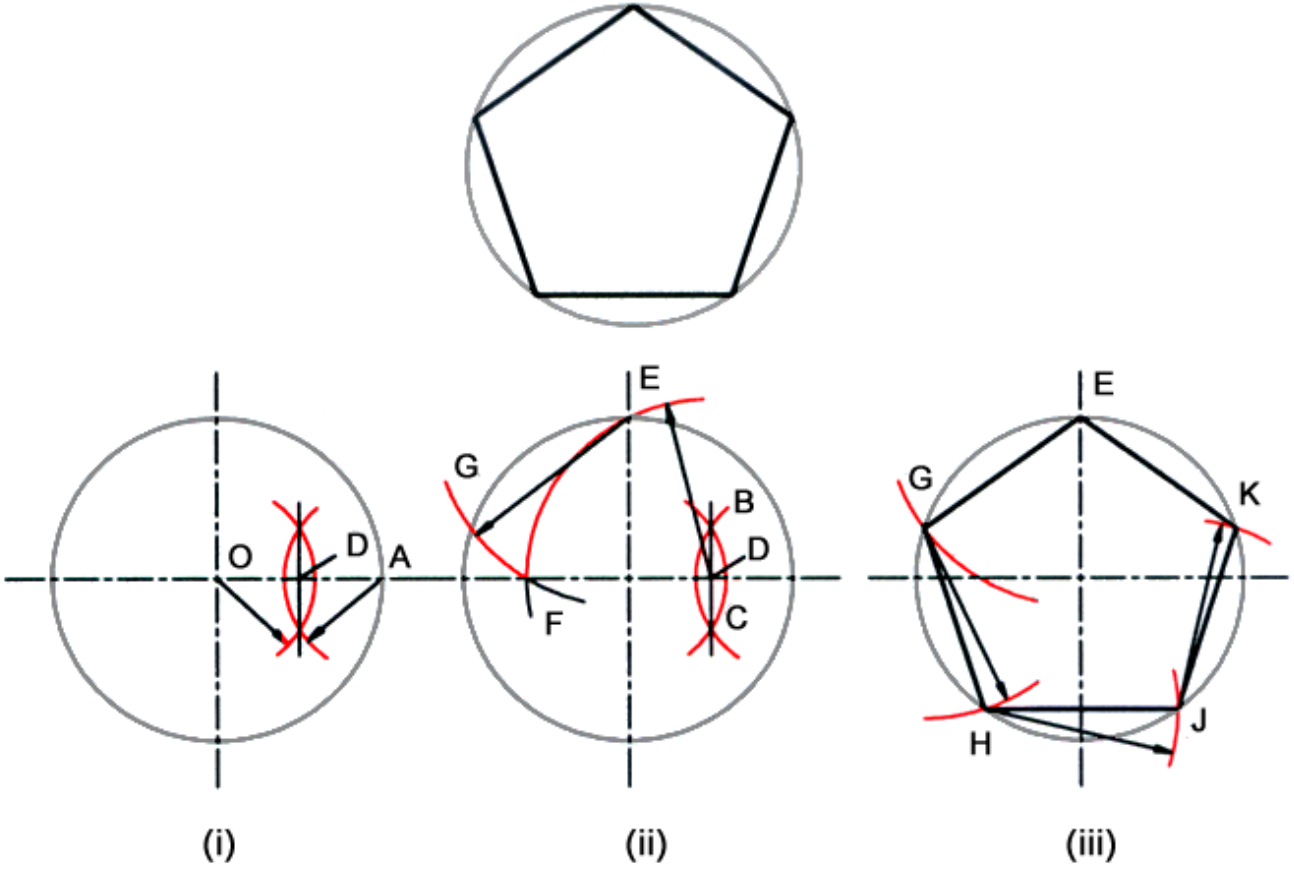
- **SQUARE / RECTANGLE**



- **Steps using QCAD**
- Click on the *create line* button and click on the *create rectangles* button
- Click at one point and click the end point to determine the length

TECHNIQUES FOR DRAWING POLYGONS (cont'd)

- **PENTAGON**

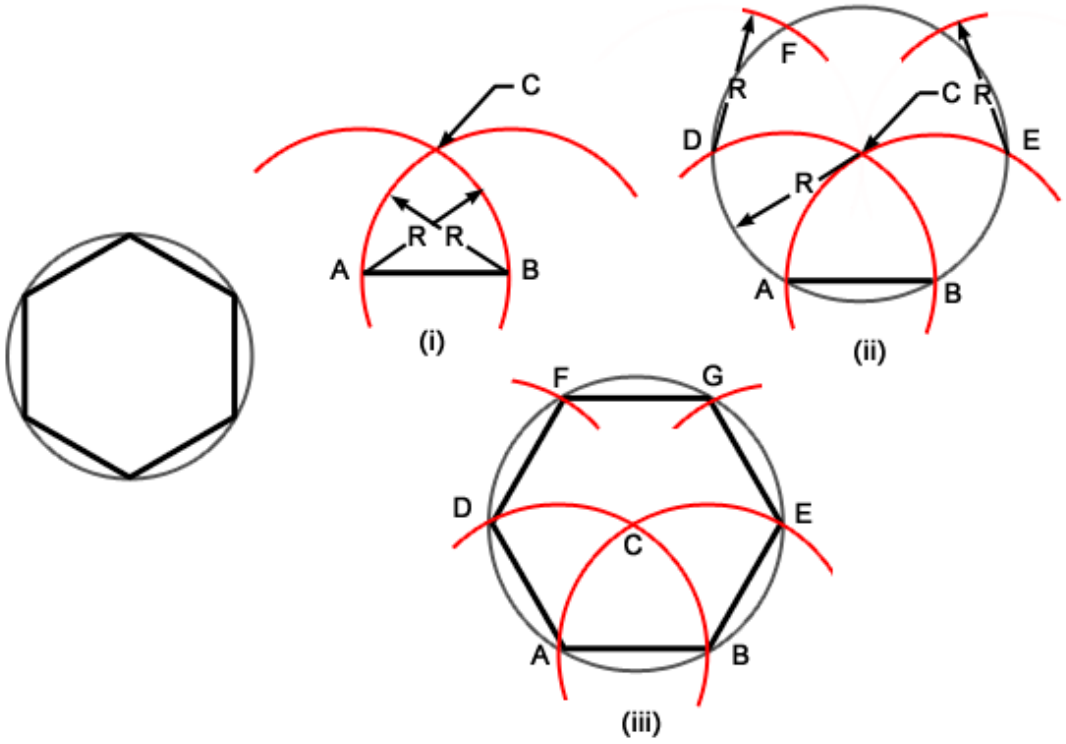


TECHNIQUES FOR DRAWING POLYGONS (cont'd)

- **Steps using QCAD**
- With given radius of a circle, draw the circle with center O
- Divide line OA into 2 same parts to produce D
- Draw an arc/circle with D as center through point E to produce F
- Draw another arc/circle with E as center through point F to produce G
- Use EG to produce points at G, H, J, K
- Connect points E, G, H, J, K to produce pentagon

TECHNIQUES FOR DRAWING POLYGONS

- **HEXAGON (Technique 1)**

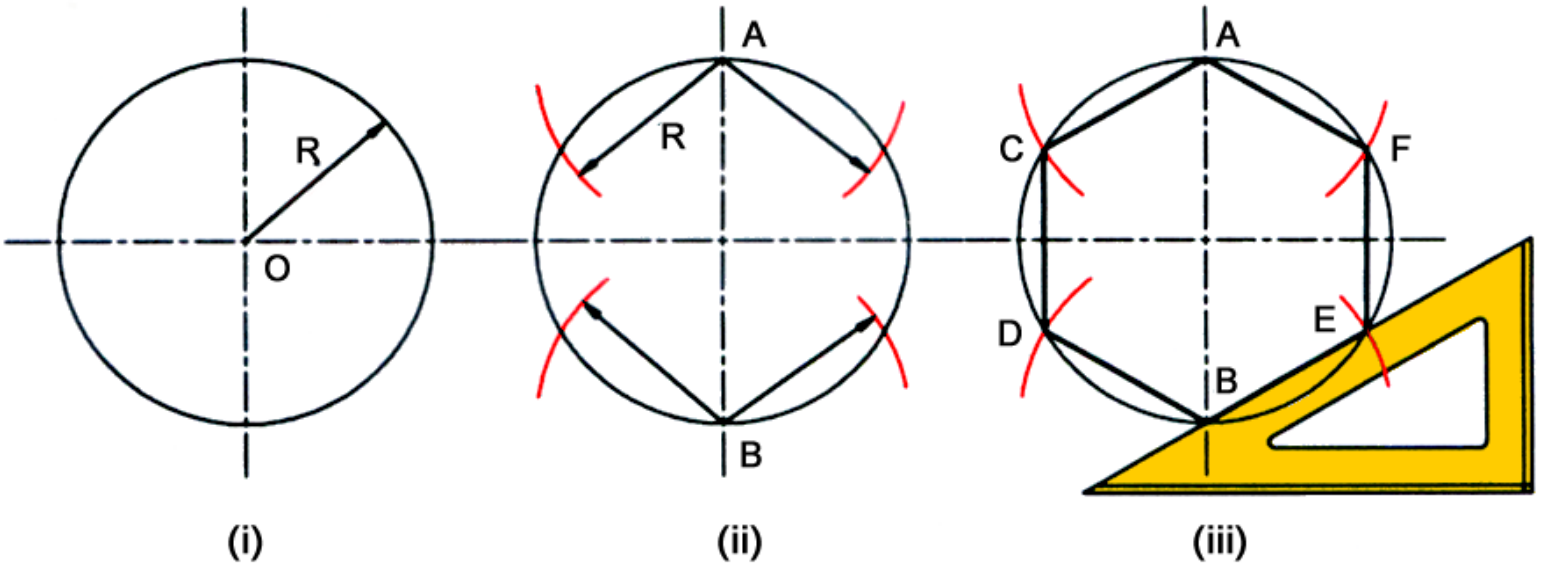


TECHNIQUES FOR DRAWING POLYGONS (cont'd)

- **Steps using QCAD**
- Given the side length AB of the hexagon
- Draw two half circles with point A & B as the center to produce point C
- Draw a circle with length AB as the radius with C as the center to produce D & E
- Using length AB, draw an arc/circle to produce point F and G
- Connect points A, D, F, G, E and B to produce the hexagon

TECHNIQUES FOR DRAWING POLYGONS (cont'd)

- **HEXAGON (Technique 2)**

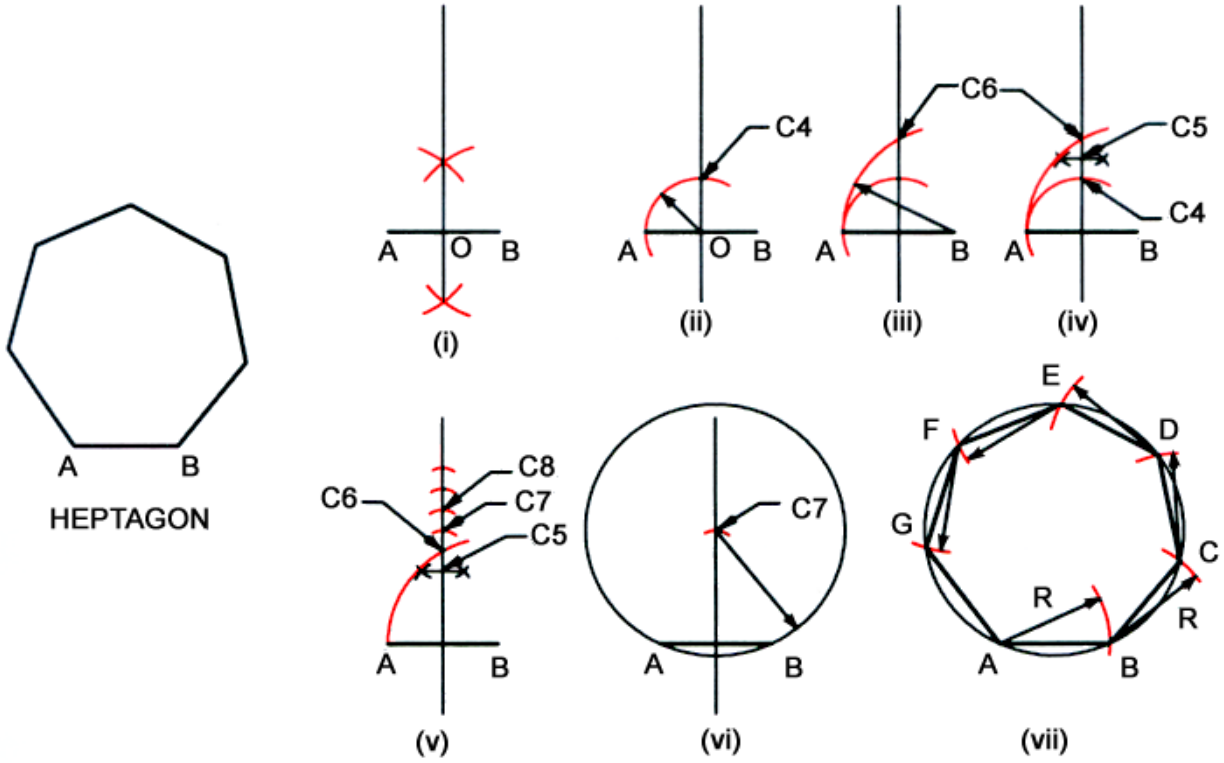


TECHNIQUES FOR DRAWING POLYGONS (cont'd)

- **Steps using QCAD**
- Given a circle with radius R and center O
- From point A and B, draw 2 arc/circle with radius R intersecting the circle (center O) to produce points C, D, E and F
- Connect points A to F to produce the hexagon.

TECHNIQUES FOR DRAWING POLYGONS (cont'd)

- **HEPTAGON**



TECHNIQUES FOR DRAWING POLYGONS (cont'd)

- **Steps using QCAD**
- Given the side length of the heptagon AB. Divide AB into 2 parts with the same length (produce point O)
- Draw a half circle (center O) with radius OA (produce point C4)
- Draw an arc/circle (center B) with radius AB to produce point C6
- Divide line (with C4 & C6 as end points) into 2 same parts to produce point C5
- Transfer point C4 to C5 to produce points C7, C8 & so on
- Using C7 as center, draw a circle & transfer length AB to the circle drawn & a heptagon is produced
- You can use point C8 and C9 as center of the circle to produce octagon and nonagon

GEOMETRY DRAWING

- Example of geometry drawing using techniques for building straight, curved line, ellipse and polygons