

**LESSON PLAN – EXERCISE 23 The Regular Pentagon on a Given Side****Objectives**

- To recognize the characteristics of a regular pentagon
- To demonstrate understanding of the construction of a regular pentagon

**Materials**

**MIRA** /Compass/pencil/ruler/grid paper

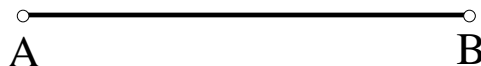
**Skills**

- Identify characteristics of a regular pentagon
- Construct a regular pentagon
- Demonstrate knowledge of a regular pentagon and term – double map

**Method/Procedure**

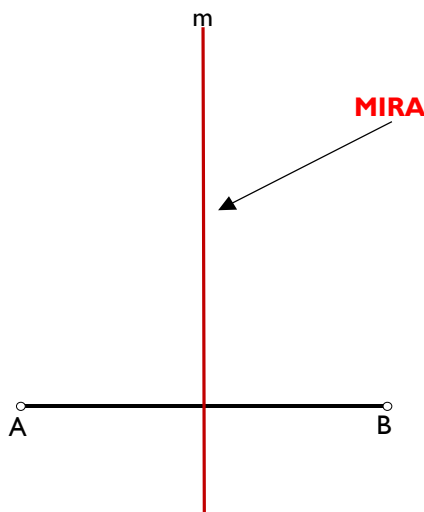
- a) Using line segment AB below, (refer to Page 45 of MIRA Activities for Middle Grades – Exercise 23), follow the instructions to draw a regular pentagon. See figure (1a) below.

Figure (1a)



- b) Draw a perpendicular bisector to line segment AB. (Using your **MIRA**, place it so that the reflection of point A falls on point B while looking through the **MIRA**). Once point A and point B match, draw your perpendicular bisector, and label this line m. See figure (1b) below.

Figure (1b)

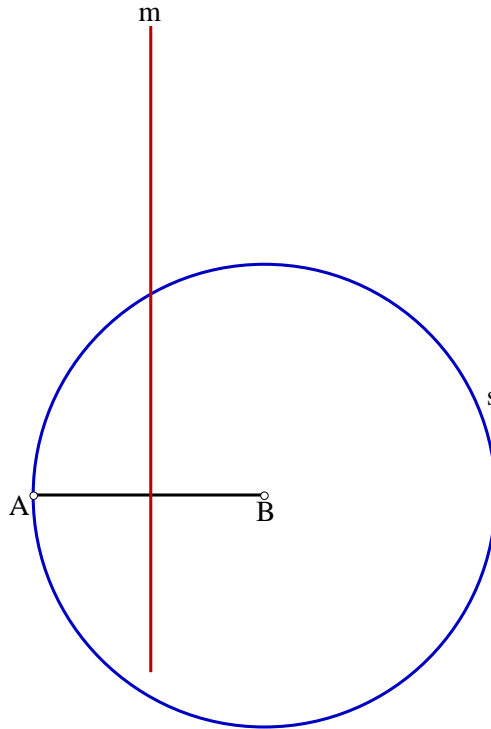


- c) Measure line segment AB (above in figure (1b)) using a compass.

**LESSON PLAN – EXERCISE 23     The Regular Pentagon on a Given Side**

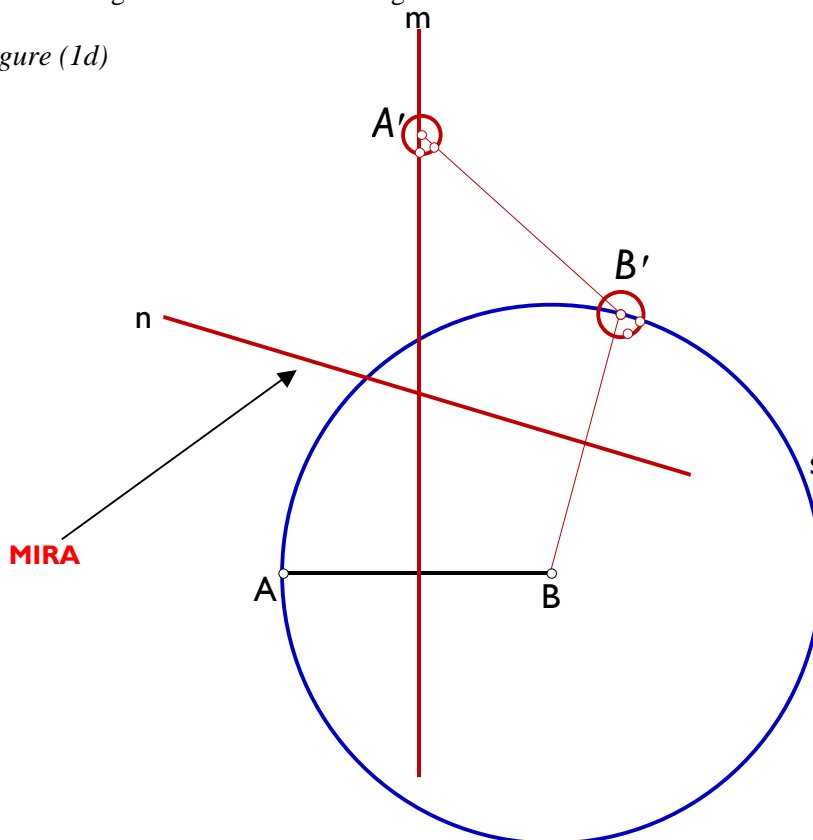
- d) Using B (the center of circle) draw a circle through point A. Label the circle *s*. Line segment AB is the radius of the circle. See figure (1c) below.

Figure (1c)



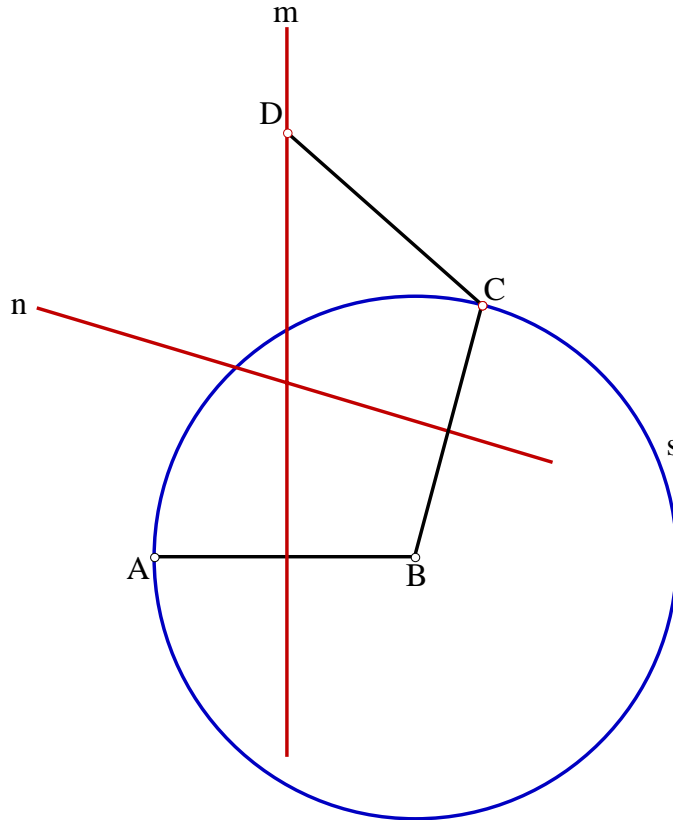
- e) **Double Map** B onto *s* and A onto *m*. This means – 2 points are simultaneously reflected through the **MIRA**. To do this, place the **MIRA** so that B lies on *s*, the circumference of the circle, and point A lies on *m* the **MIRA** line. See figure (1d) below. Draw the **MIRA** line *n* of this mapping. (The **MIRA** line *n*, is a perpendicular bisector of B and *B'*). Label the image of A as D and the image of B as C. Join DC and BC. See figure (1e) below.

Figure (1d)



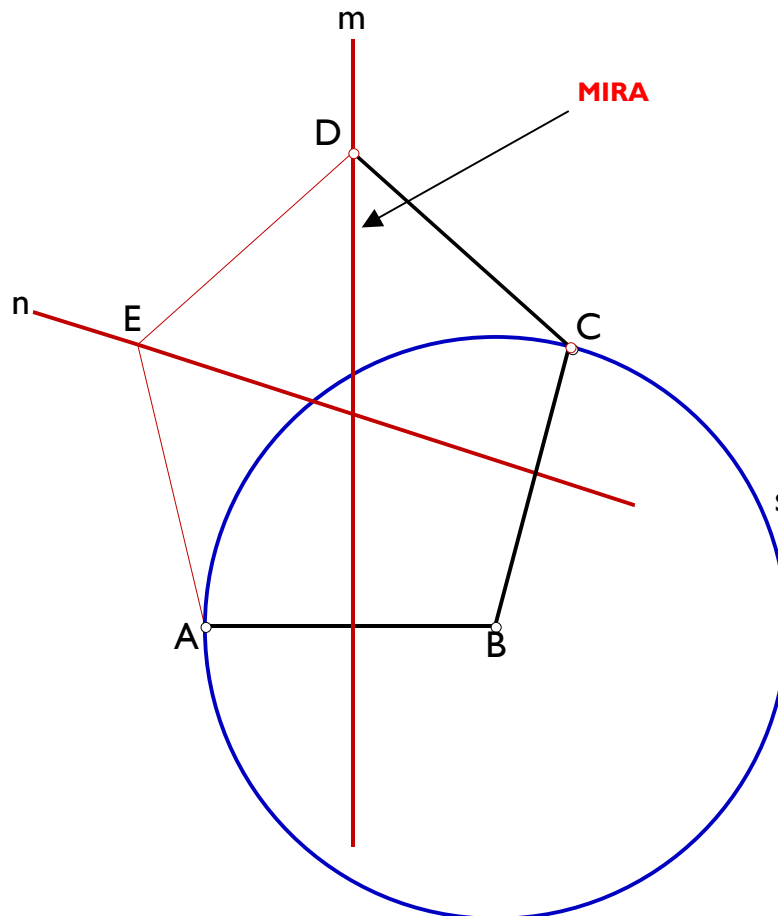
**LESSON PLAN – EXERCISE 23      The Regular Pentagon on a Given Side**

Figure (1e)



- f) Place the **MIRA** back onto line m and reflect point C through it and label the image of C point E. See figure (1f) below.

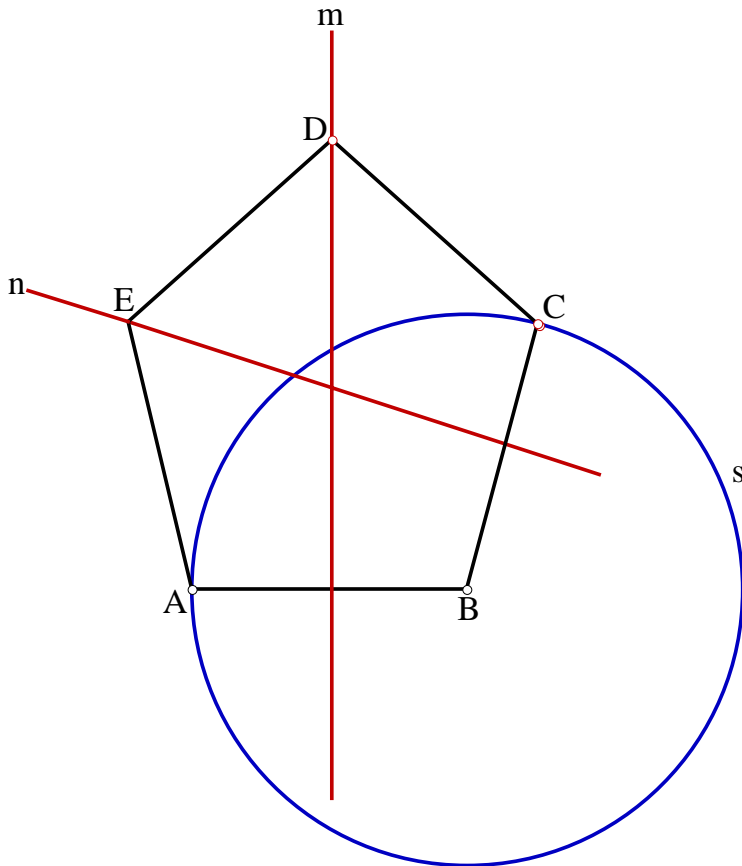
Figure (1f)



**LESSON PLAN – EXERCISE 23     The Regular Pentagon on a Given Side**

g) Now complete the pentagon ABCDE. See figure (1g) below.

Figure (1g)

**Discovery**

- The pentagon has equal angles and equal sides because each line segment on the pentagon can be bisected perpendicularly and all these perpendicular bisectors will intersect at the center of the pentagon.