

Geometry CC - Unit 2

Lesson 3: Constructing an Equilateral Triangle (day 2)

MI L2

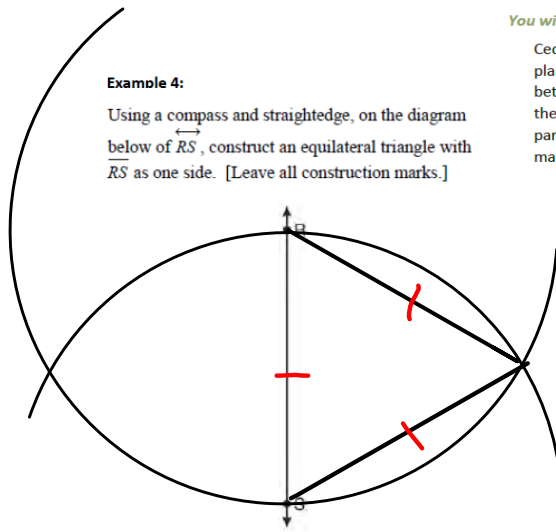
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Homework: HW Handout 2.3

HW Answers 2.2

Example 4:

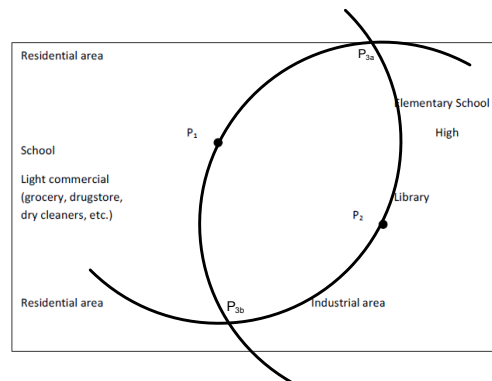
Using a compass and straightedge, on the diagram below of \overline{RS} , construct an equilateral triangle with \overline{RS} as one side. [Leave all construction marks.]



Example 5:

You will need a compass and straightedge

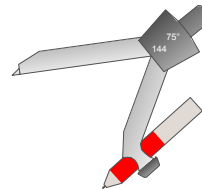
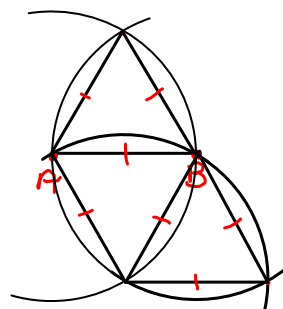
Cedar City boasts two city parks and is in the process of designing a third. The planning committee would like all three parks to be equidistant from one another to better serve the community. A sketch of the city appears below, with the centers of the existing parks labeled as P_1 and P_2 . Identify two possible locations for the third park and label them as P_{3a} and P_{3b} on the map. Clearly and precisely list the mathematical steps used to determine each of the two potential locations.



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Exploratory Challenge 1

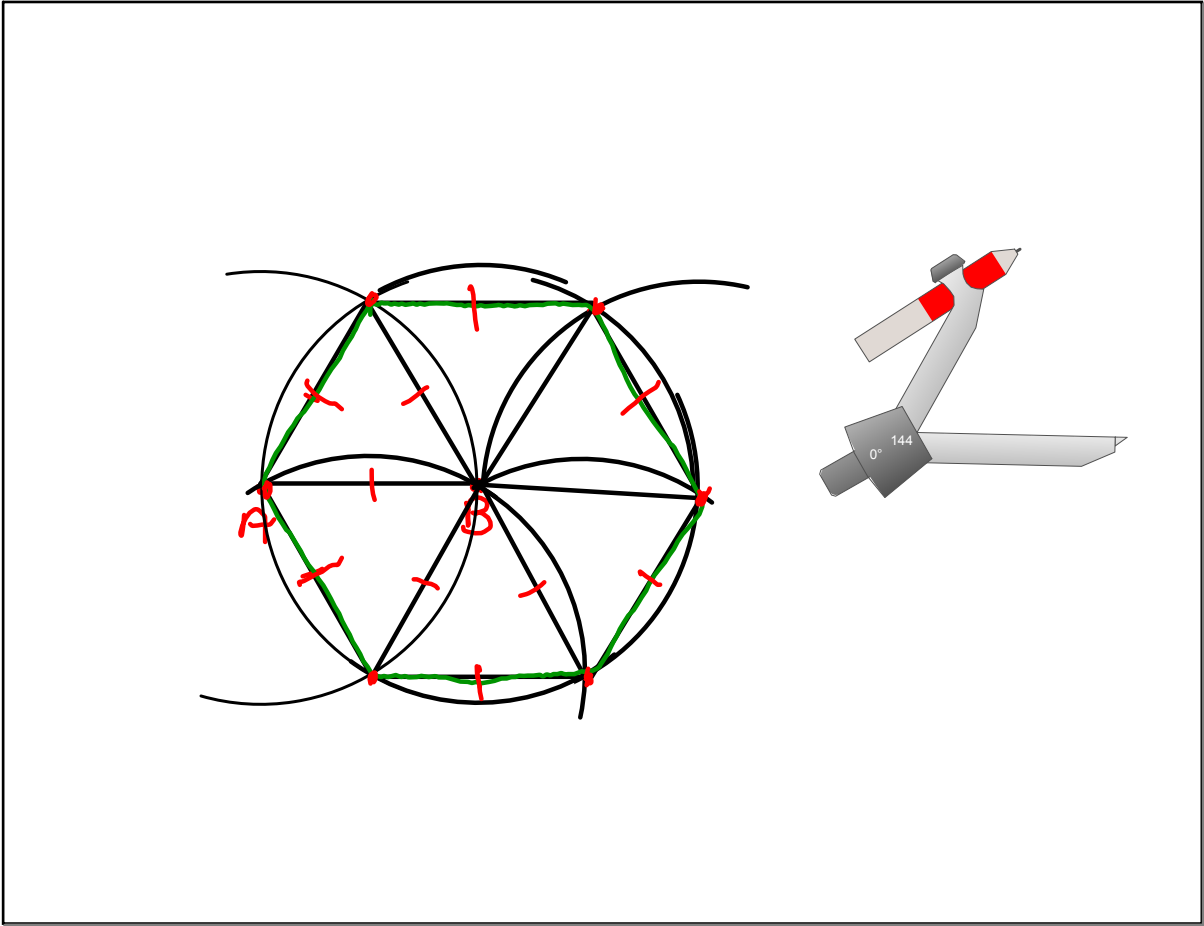
Using the skills you have practiced, construct **three** equilateral triangles, where the first and second triangles share a common side, and the second and third triangles share a common side.



Steps

- 1) Draw a segment \overline{AB} .
- 2) Draw circle A: center A, radius \overline{AB} .
- 3) Draw circle B: center B, radius \overline{BA} .
- 4) Label one intersection as C and the other as D.
- 5) Draw circle C: center C, radius \overline{CA} .
- 6) Label the unlabeled intersection (with either circle A or circle B) as E.
- 7) Draw all segments that are congruent to \overline{AB} between the labeled points.

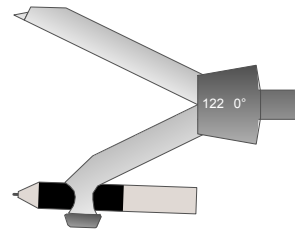
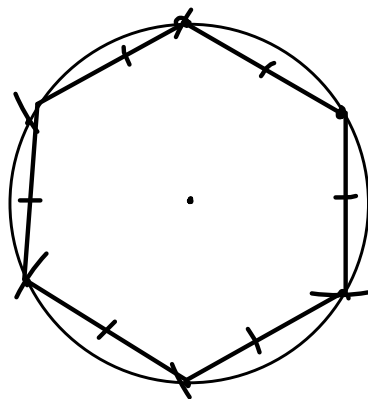
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Exploratory Challenge 2:

Use the skills you have developed in this lesson to construct a **regular hexagon**.



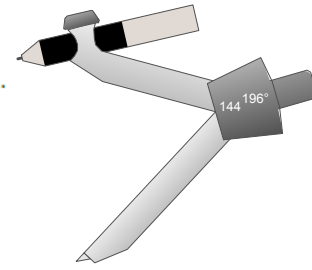
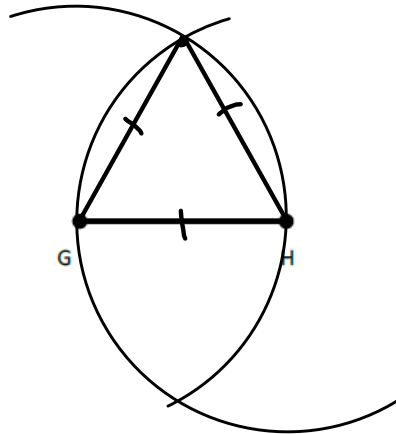
Steps

- 1) Draw a segment \overline{AB} .
- 2) Draw circle A: center A, radius \overline{AB} .
- 3) Draw circle B: center B, radius \overline{BA} .
- 4) Label one intersection as C and the other as D.
- 5) Draw circle C: center C, radius \overline{CA} .
- 6) Label the unlabeled intersection with circle A as E.
- 7) Continue to treat the intersection of each new circle with circle A as the center of a new circle until the next circle to be drawn is circle D.
- 8) Draw all segments that are congruent to \overline{AB} between the labeled points.

Can you repeat the construction of a hexagon until the entire sheet is covered in hexagons (except the edges will be partial hexagons)?

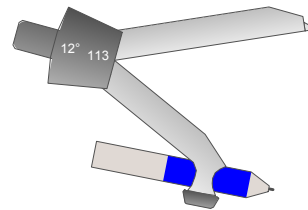
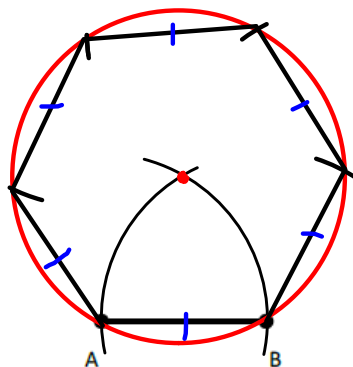
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1) Construct an **equilateral triangle** with the given side length.



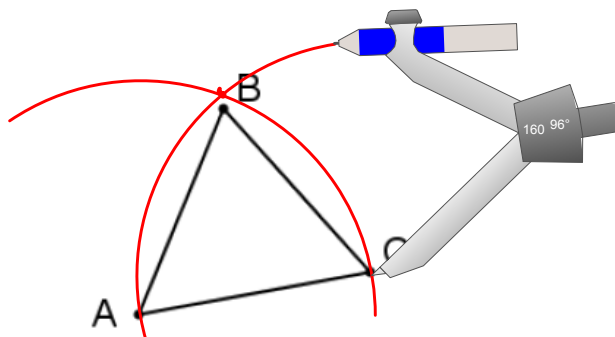
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2) Construct a **regular hexagon** with the given side length



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- 3) $\triangle ABC$ is shown below. Is it an equilateral triangle? Justify your response.
(Hint: Use your compass!)



No, this is not an equilateral triangle because the construction should have an intersect at vertex B.

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