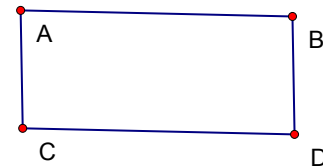


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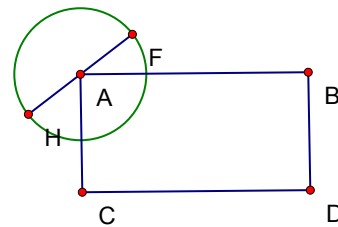
### Explanation for Construction #8

Given: Points A, B, C, and D are midpoints of the sides of a quadrilateral.  
Construct the quadrilateral.

- Points A, B, C, and D must form a parallelogram if they are to be midpoints of a quadrilateral. So, you must first construct a parallelogram just to create the initial conditions. (This was given to me as a hint.)
- While researching about quadrilaterals, I ran across a theorem that made something click in my brain. The theorem was this: when the midpoints of the sides of a quadrilateral are connected, the resulting shape is always a parallelogram.
- Therefore, it makes sense to realize that all we have to construct is a quadrilateral with this parallelogram inscribed within it.
- In order to construct the vertices of the parallelogram into midpoints, I knew I had to get segments of equal length on either side of a given point, thus when these two equal segments were put together, they would create a side of the quad with a given point as the midpoint. Hence, I constructed a circle.



- In order to construct the three other sides of the quadrilateral, I knew I had to form segments with the existing endpoints (from the diameter of the circle) and a new given point, and thus create new circles with new radii so that new sides could be constructed.



- I know the given points are midpoints of the sides because the lengths from each to the end of the segment are equal since I constructed circles using each segment's length as the radius. Once I constructed the final side, I had formed a complete quad with four sides of which the given points were midpoints.

*(Keep in mind there are many quads that work as a solution for this problem.)*

