

Problem 1 – Exploring the Perpendicular Bisector Theorem

On page 1.3, measure AC and BC . Remember that AC means the length of \overline{AC} .

- Move point C to four different positions and record the measurements in the table below using the **Length** tool (**menu** > **Measurement** > **Length**).

Position	1 st position	2 nd position	3 rd position	4 th position
AC				
BC				

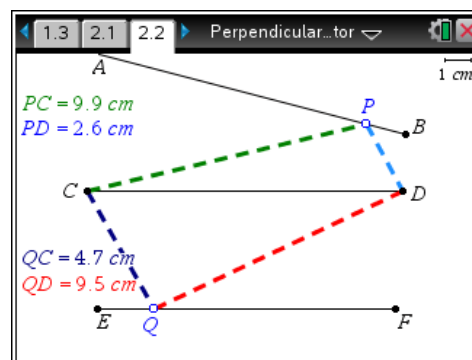
- What is the relationship between the measurements of AC and BC ?
- Complete the following conjecture about how lengths AC and BC are related.

If a point C is on the perpendicular bisector of \overline{AB} , then $AC =$ _____.

- Generalize your conjecture. If a point is on the perpendicular bisector of a segment, then it is _____ from the endpoints of a segment.

Problem 2 – Converse of the Perpendicular Bisector Theorem

On page 2.2 you are given three segments; \overline{AB} , \overline{CD} , and \overline{EF} . Points P and Q are on segments \overline{AB} and \overline{EF} , respectively. You are given PC , PD , QC , and QD .



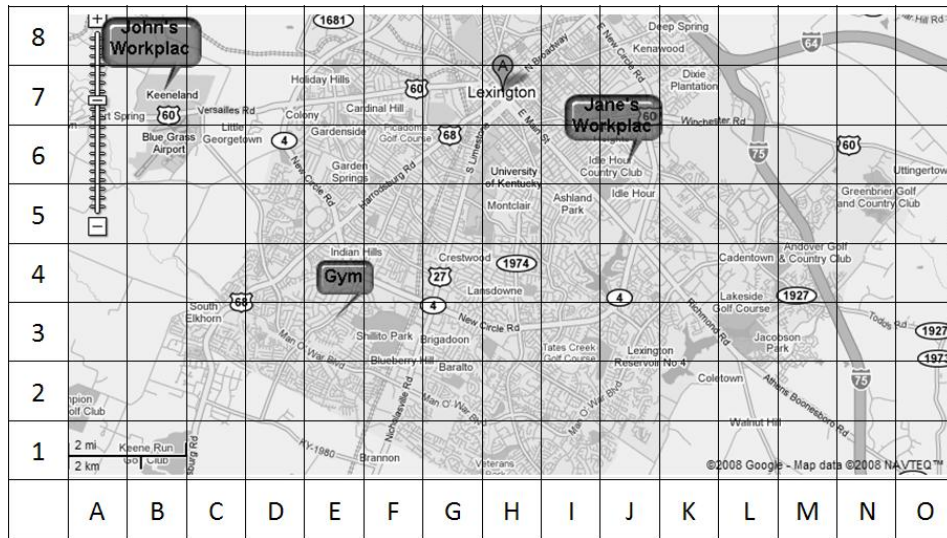
- Move point P until it is equidistant from C and D .
Move point Q until it is equidistant from C and D .
What is common about points P and Q when they are equidistant from C and D ?

- Construct the perpendicular bisector of CD using the **Perpendicular Bisector** tool (**menu** > **Construction** > **Perpendicular Bisector**).
- What do you notice about points P and Q and the perpendicular bisector of CD ?
- Complete the following conjecture. If point P is equidistant from endpoints C and D , then _____.

Perpendicular Bisector

Problem 3 – An Application of the Perpendicular Bisector Theorem

- John and Jane are young college graduates relocating to a new city. They have jobs at separate locations, but work out at the same gym. They would like to rent an apartment that is equidistant from their jobs and gym. They use the map below and see that John's workplace is located at B7, Jane's workplace is at J6, and their Gym is located at E3.



- How could B7 be represented on a Cartesian graph as an ordered pair? J6? E3?
- Use the graph on page 3.1 and the perpendicular bisector theorem to decide where John and Jane should live. Round your answer to the nearest whole number.
- Using the map's notation, where should the graduates live?