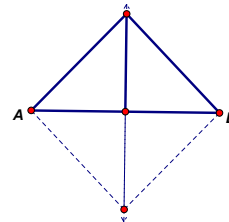


Perpendicular bisector theorem hint through:

Part 1: For any segment, there exists a midpoint and a perpendicular bisector.

- Remember (or look up) how to construct a perpendicular bisector using a compass and straight edge (circles and lines). Describe the process, and name the circles, points and lines that you make along the way. You should make 3 points in addition to the original 2 endpoints of the line segment.
- Connect the points to make some triangles. You should have several triangles, and some of them will be isosceles.
- Use the isosceles triangles to prove that some angles are congruent.
- Use the equal lengths and angles you have to prove that 2 of the smaller triangles are congruent:



Part 2: For any segment, there can't be more than one midpoint:

Prove by contradiction:

- Assume there's more than one midpoint. That means there are at least two of them: name them.
- Write down some distance equations.
- Do algebra. Get a contradiction. You may want to use the distance axiom or theorem 2.

Part 3: For any segment, there can't be more than one perpendicular bisector:

- Any time you're proving that there can't be more than one of something, you want to try a proof by contradiction.
- Write down your assumptions
- Now, notice that both of those perpendicular bisectors have to go through the midpoint, and you already proved there's only one midpoint.
- Also, you should be able to write down something about angles because they're perpendicular to the given segment.
- You should be able to find a contradiction again. If you use a theorem to help you, which is more likely to be helpful: theorem 1 or theorem 2?