Points on a Perpendicular Bisector – ID: 8869

Time required
30 minutes

Topic: Triangles and Their Centers

- *Use inductive reasoning to postulate a relationship between a line segment and its perpendicular bisector.*
- *Apply the Perpendicular Bisector Theorem and its converse.*

Activity Overview

In this activity, students will explore the relationship between a line segment and its perpendicular bisector. The concept of "a point that is equidistant from two points" is illustrated.

Teacher Preparation

This activity is designed to be used in a high school or middle school geometry classroom.

- *The Perpendicular Bisector Theorem states:*
  If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.
- *The screenshots on pages 1–3 demonstrate expected student results.*
- ***To download the student worksheet, go to education.ti.com/exchange and enter "8869" in the quick search box.***

Classroom Management

- *This activity is designed to be **student-centered** with the teacher acting as a facilitator while students work cooperatively. Use the following pages as a framework as to how the activity will progress.*
- *The student worksheet helps guide students through the activity and provides a place for students to record their answers and observations.*

TI-84 Plus Applications

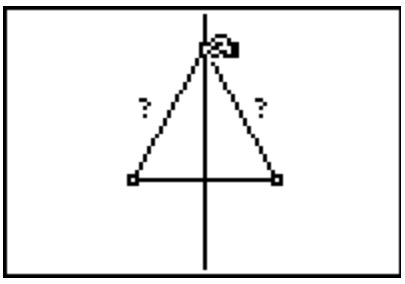
Cabri Jr.

Points on a Perpendicular Bisector

ID: 8869

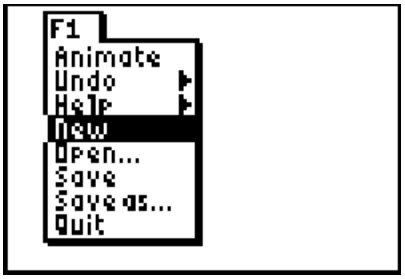
In this activity, you will:

- *Draw a line segment.*
- *Draw the perpendicular bisector.*
- *Investigate the distance between a point on the perpendicular bisector and endpoints of the segment.*



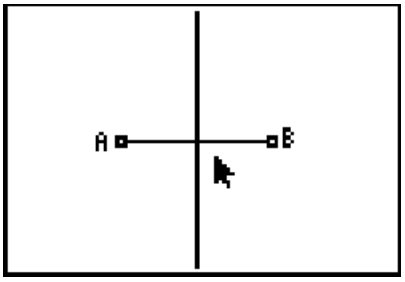
Press [APPS]. Move down to the CabriJr APP and press [ENTER]. Press [ENTER], or any key, to begin using the application.

Press [Y=] for the F1 menu and select **New**. (If asked to **Save changes?** press [◄] [ENTER] to choose "No.")

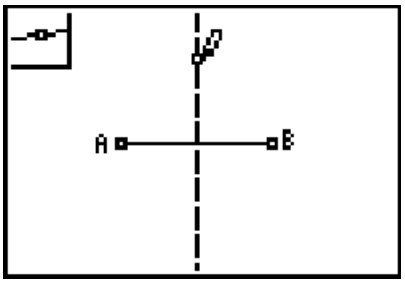


Press [WINDOW] for the F2 menu, move to **Segment**, and press [ENTER]. Move the pencil to the desired location of the first endpoint of the segment and press [ENTER]. Move right to the desired location of the second endpoint and press [ENTER]. Label the endpoints *A* and *B* using the **Alpha-Num** tool from the F5 menu.

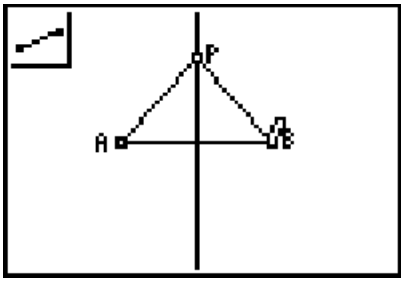
Select the **Perp. Bis.** tool from the F3 menu. Move the pencil until it becomes an arrow and the segment flashes. Press [ENTER] and the perpendicular bisector of $\overline{AB}$ is drawn.



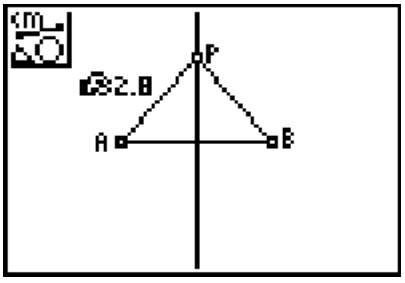
Select the **Point On** tool (**F2 > Point > Point On**). Move the pencil until the perpendicular bisector is flashing, and press ENTER. Label this point *P*.



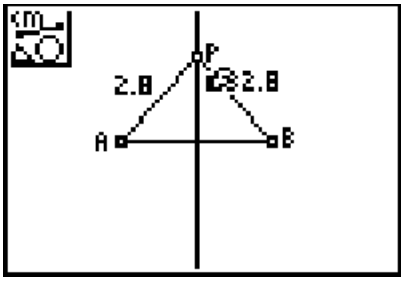
Select the **Segment** tool. Move the pencil until point *P* drawn on the bisector is flashing and press ENTER. Move to point *A* and once it is flashing, press ENTER. Now create another segment from point *P* to point *B*. (The distance from the endpoints to the point on the perpendicular bisector can be measured without the segments, but they provide a better illustration of the distance measured.)



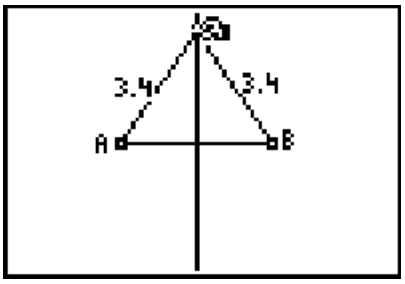
Select the **D. & Length** tool (**F5 > Measure > D. & Length**). Move the pencil near one of the segments and when it is dashed and flashing, press ENTER. The *hand* is active and the measurement can be moved to a convenient location. Press ENTER to place the measurement and deactivate the *hand*.



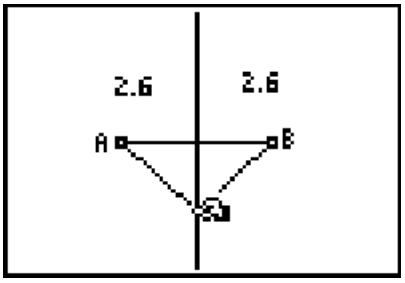
The measurement tool is still active and you can now measure the distance from the point on the perpendicular bisector to the other endpoint of the segment. Move the pencil to the other segment and press ENTER when it is flashing. The new measurement appears and can be placed where desired by pressing ENTER. Press CLEAR to deactivate the measurement tool.



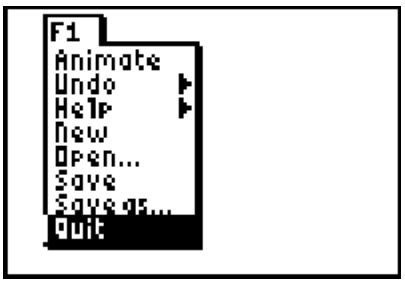
Move the arrow near the point on the perpendicular bisector. When the point is flashing, press [ALPHA] to activate the *hand*. Move the point up to a new location on the perpendicular bisector and observe the changes in the measurements of the distances to the endpoints.



Move the point down to a new location on the perpendicular bisector and observe the changes in the measurements of the distances to the endpoints.



To exit the APP, select **Quit** from the F1 menu. (Or you can press [2nd] [MODE] for [QUIT].)



$\overline{AQ} \cong \overline{BQ}$ and $\overline{PQ} \perp \overline{AB}$

Conjecture: Any point on the perpendicular bisector of a line segment is _____ from the endpoints of the segment.