Perpendicular Bisector

ID: 11199

Time Required
15 minutes

Activity Overview

In this activity, students will explore the perpendicular bisector theorem and discover that if a point is on the perpendicular bisector of a segment, then the point is equidistant from the endpoints. This is an introductory activity where students will need to know how to change between pages, grab and move points, measure lengths, and construct the perpendicular bisector.

Topic: Triangles & Their Centers

- *Perpendicular Bisector Theorem*
- *Converse of the Perpendicular Bisector Theorem*

Teacher Preparation and Notes

- *Problem 3 of this activity is designed for use as an extension or homework problems.*
- ***To download the student TI-Nspire document (.tns file) and student worksheet, go to education.ti.com/exchange and enter "11199" in the keyword search box.***

Associated Materials

- *PerpendicularBisector_Student.doc*
- *PerpendicularBisector.tns*

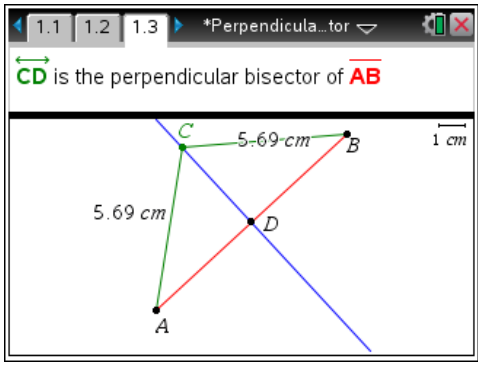
Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the keyword search box.

- *Points on a Perpendicular Bisector (TI-Nspire technology) — 8868*
- *Chords and Circles (TI-Nspire technology) — 9423*
- *Investigate Perpendicular Bisector (TI-84 Plus family) — 7262*
- *Perpendicular Bisector of a Line Segment (TI-84 Plus family) — 6856*

Problem 1 – Exploring the Perpendicular Bisector Theorem

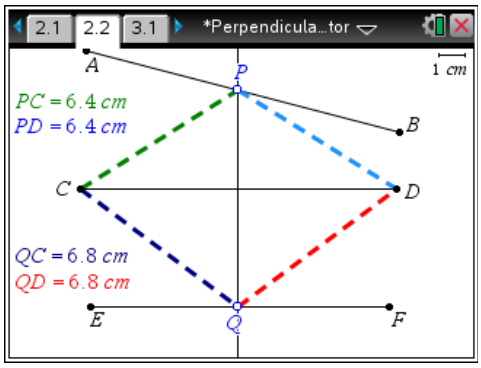
Students will be exploring the distance from a point on the perpendicular bisector to the endpoints of a segment.



- Students will first use the **Length** tool (menu **> Measurement > Length**) to measure *AC* and *BC*.
- Students will then move point *C* around and find that *AC* and *BC* is always the same.
- Students will discover that if a point is on the perpendicular bisector of a segment, then it is equidistant from the two endpoints of the segment.

Problem 2 – Converse of the Perpendicular Bisector Theorem

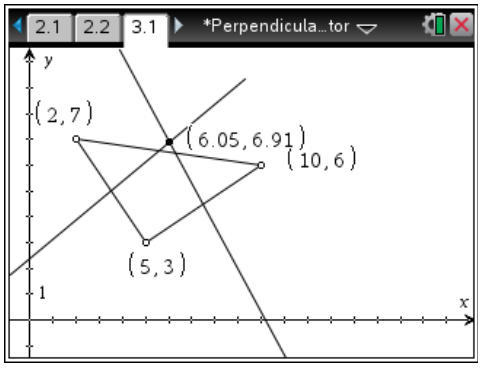
Students will be exploring where a point lies if it is equidistant from the two endpoints.



- Students will first move points *P* and *Q* around to find out when the distance *PC* = *PD* and *QC* = *QD*.
- Students will then use the **Perpendicular Bisector** tool (**menu > Construction > Perpendicular Bisector)** to create the perpendicular bisector of $\overline{CD}$ to notice that *P* and *Q* both lie on the perpendicular bisector.
- Students will notice that points *P* and *Q* both are on the perpendicular bisector of $\overline{CD}$.

Problem 3 – An Application of the Perpendicular Bisector Theorem

Student will apply what they learned from Problem 1 and find the intersection of two perpendicular bisectors to find a point equidistant from three points.



Student Worksheet Solutions

Problem 1 – Exploring the Perpendicular Bisector Theorem

- Answers will vary. The measures of $\overline{AC}$ and $\overline{BC}$ should be equal.
- Sample answer: *AC* is congruent to *BC*. The distances are the same.
- If a point is on the perpendicular bisector of a segment, then it is equidistant from the two endpoints of the segment.

Problem 2 – Converse of the Perpendicular Bisector Theorem

- It appears that points *P* and *Q* may lie on the perpendicular bisector.
- Points *P* and *Q* lie on the perpendicular bisector.
- If point *P* is equidistant from endpoints *C* and *D*, then it lies on the perpendicular bisector of $\overline{CD}$.

Problem 3 – An Application of the Perpendicular Bisector Theorem

- B7 would be (2, 7). J6 would be (10, 6). E3 would be (5, 3).
- (6, 7)
- F7