Reteaching 5-2

Bisectors in Triangles

OBJECTIVE: Determining whether a given point lies on the perpendicular bisector of a segment

MATERIALS: Graph paper

Example

Given points $A(1, 3)$, $B(5, 1)$, and $C(4, 4)$, does C lie on the perpendicular bisector of $\overline{AB}$?

Plot the points on a coordinate grid. Draw $\overline{AB}$.
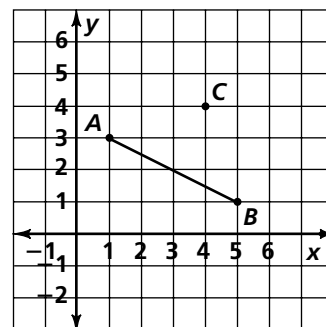Use the distance formula to determine whether $AC = BC$.

$$AC = \sqrt{(1 - 4)^2 + (3 - 4)^2} \qquad BC = \sqrt{(5 - 4)^2 + (1 - 4)^2}$$

$$AC = \sqrt{(-3)^2 + (-1)^2} \qquad BC = \sqrt{1^2 + (-3)^2}$$

$$AC = \sqrt{9 + 1} \qquad BC = \sqrt{1 + 9}$$

$$AC = \sqrt{10} \qquad BC = \sqrt{10}$$

Because $AC = \sqrt{10}$ and $BC = \sqrt{10}$, $AC = BC$, and C lies on the perpendicular bisector of $\overline{AB}$.

Exercises

Complete these exercises on bisectors.

1. Given $D(3, 1)$, $E(7, 2)$, and $F(4, 5)$, does F lie on the perpendicular bisector of $\overline{DE}$?

2. Given $X(1, 2)$, $Y(7, 2)$, and $Z(4, 6)$, does Z lie on the perpendicular bisector of $\overline{XY}$?

3. Given $H(-4, 5)$, $I(-6, 2)$, and $J(-1, 3)$, does H lie on the perpendicular bisector of $\overline{IJ}$?

4. Given $P(-7, -7)$, $Q(-5, -2)$, and $R(0, -5)$, does Q lie on the perpendicular bisector of $\overline{PR}$?

5. Point $T(-9, 5)$ lies on the perpendicular bisector of $\overline{UV}$. If the coordinates of point U are $(-2, 1)$, which of the following are the coordinates of point V?

   A. $(-2, 7)$ **B.** $(-1, 6)$ **C.** $(0, 5)$

6. Use the diagram at the right. Which of the following points lies on the angle bisector of $\angle ABC$?

   A. $(6, 5)$ **B.** $(7, 8)$ **C.** $(4, 4)$