Lesson 2.3.7: Angle Bisector and Similarity

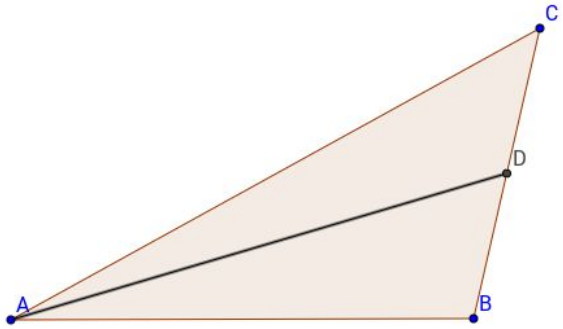
Targets:

1. I can use the angle bisector theorem to find missing measurements.

Warm Up

Let's investigate the relationship between an angle bisector and the lengths of the sides of a triangle. Use the diagram to the right to see if we can find a relationship between any segments.

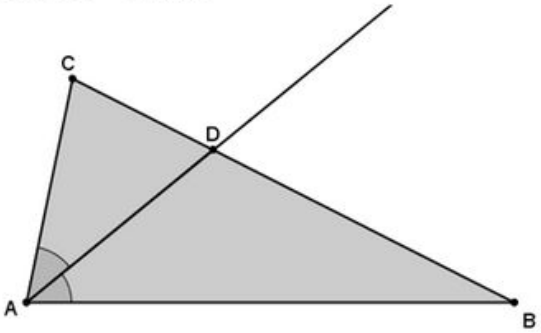
1. Use a ruler to find the lengths of the following segments: AC, AB, CD, and BD.
2. Try to find some kind of relationship between the segments above.
3. Use the segment lengths to write a proportion.



Angle Bisector Theorem

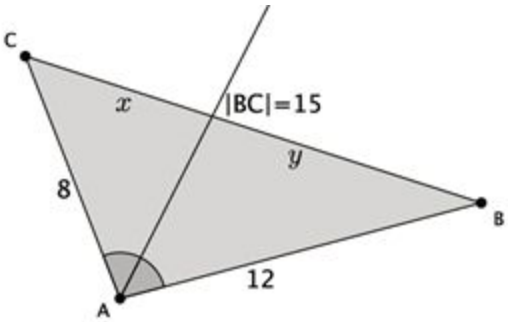
The bisector of an angle of a triangle splits the opposite side into segments that have the same ratio as the adjacent sides.

ANGLE BISECTOR THEOREM: The angle bisector theorem: In $\triangle ABC$, if the angle bisector of $\angle A$ meets side BC at point D, then $BD:CD = BA:CA$.



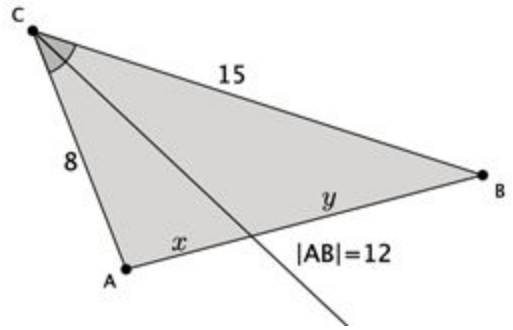
Practice 1

The sides of a triangle are 8, 12, and 15. An angle bisector meets the side of length 15. Find the lengths x and y. Explain how you arrived at your answers.



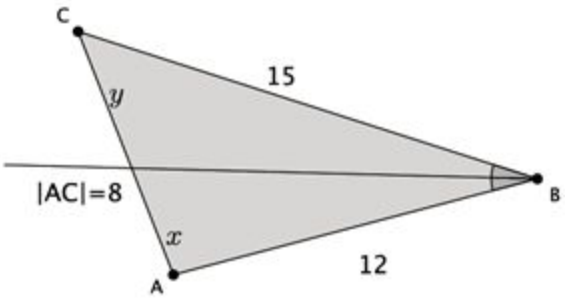
Practice 2

The sides of a triangle are 8, 12, and 15. An angle bisector meets the side of length 12. Find the lengths x and y.



Practice 3

The sides of a triangle are 8, 12, and 15. An angle bisector meets the side of length 8. Find the lengths x and y.



Exit Ticket

For your exit ticket, take a look at the triangle to the right. Notice the measurements of all the segments.

- Based on the given information, is ray AD the angle bisector of angle A?
- Make sure to show your calculations in your answer.