Lesson 18: Similarity and the Angle Bisector Theorem

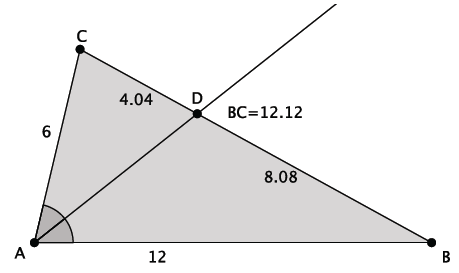
Classwork

Opening Exercise

* 1. What is an angle bisector?
  2. Describe the angle relationships formed when parallel lines are cut by a transversal.
  3. What are the properties of an isosceles triangle?

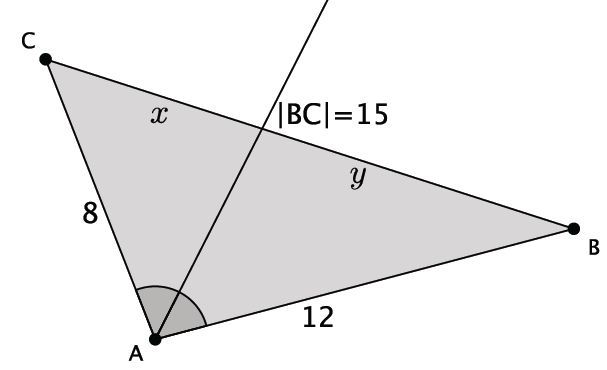
Discussion

In the diagram below, the angle bisector of in meets side at point . Does the angle bisector create any observable relationships with respect to the side lengths of the triangle?

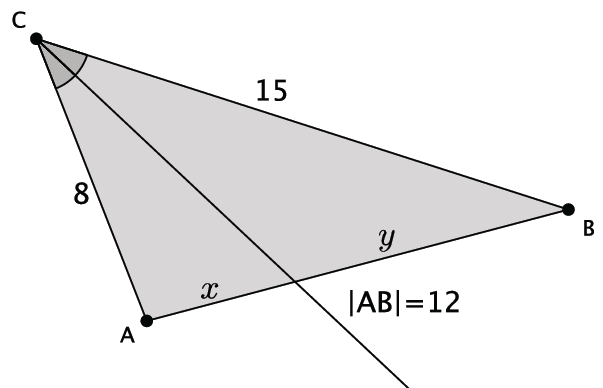
****

Exercises 1–4

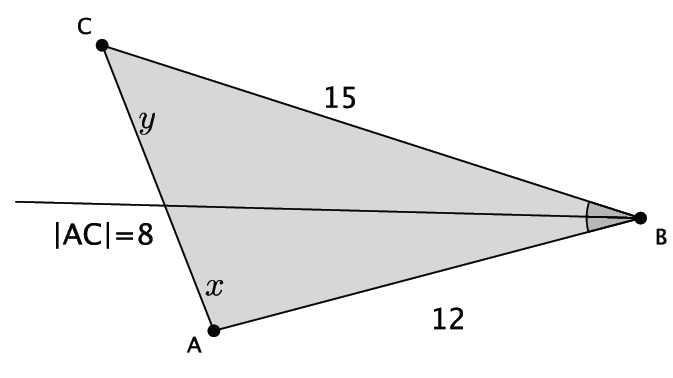
1. The sides of a triangle are ,, and . An angle bisector meets the side of length . Find the lengths and . Explain how you arrived at your answers.



1. The sides of a triangle are , , and . An angle bisector meets the side of length . Find the lengths and .



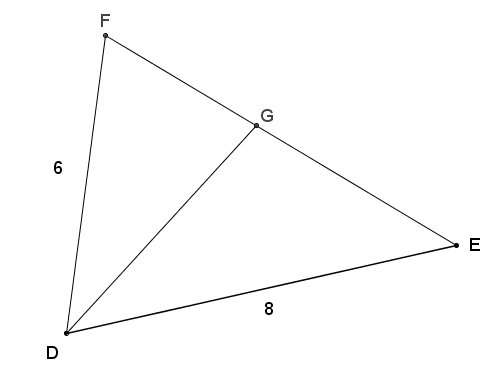
1. The sides of a triangle are ,, and . An angle bisector meets the side of length Find the lengths and .

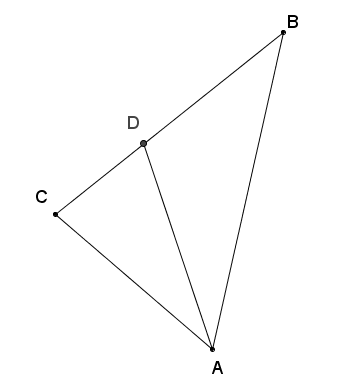


1. The angle bisector of an angle splits the opposite side of a triangle into lengths and . The perimeter of the triangle is . Find the lengths of the other two sides.

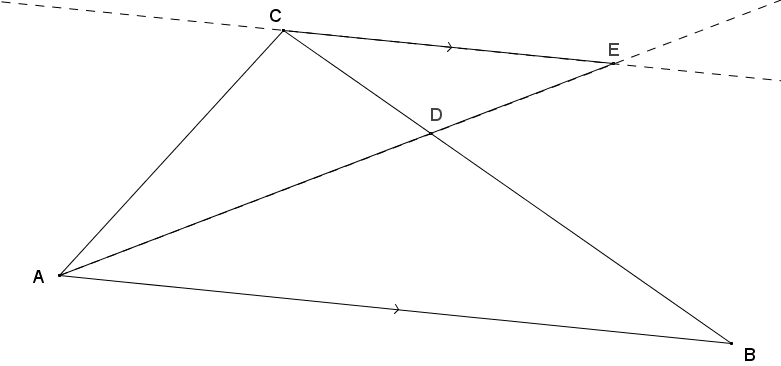
Problem Set

1. The sides of a triangle have lengths of and An angle bisector meets the side of length Find the lengths and .
2. The sides of a triangle are ,, and An angle bisector meets the side of length . Find the lengths and .
3. In the diagram of triangle below, is an angle bisector, , , and . Find and .





1. , show that .
2. The perimeter of triangle is . is the angle bisector of angle , , and . Find and .
3. Given , , , , , and , find the perimeter of quadrilateral
4. If meets at such that , show that . Explain how this proof relates to the angle bisector theorem.



1. In the diagram below, , bisects , , and . Prove that .

