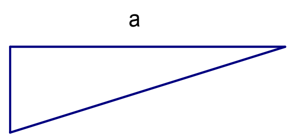
The explanations of the strategies you would employ in approaching the constructions are very good. An "excellent" explanation would also convey how one could turn that strategy into a clear plan for the actual construction.

95%

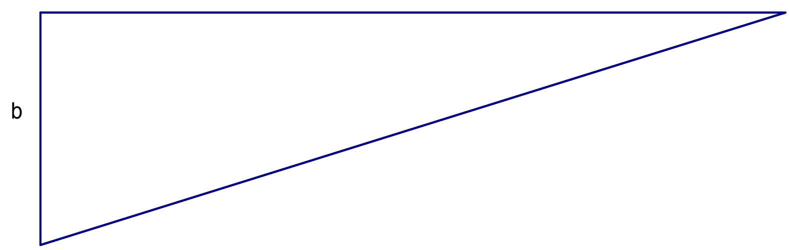
[redacted]
MTED 3900
Professor Thompson
9/24/02
Explanations

4. Given segments of length **a** and **b**. Construct a segment of length **a*b**.

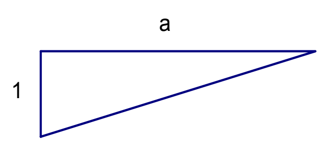
When thinking about this problem it is first important to think about the idea of multiplication and how it might apply to geometric figures. One way to think about it is to approach either a or b as a constant and the other as a variable. If I made **a** my constant and b my variable I could establish a relationship where **a** is to **ab** as **1** is to **b**. Basically a ratio. One way to define this type of relationship with geometric figures is through similar triangles. If I had a triangle of with one side length a

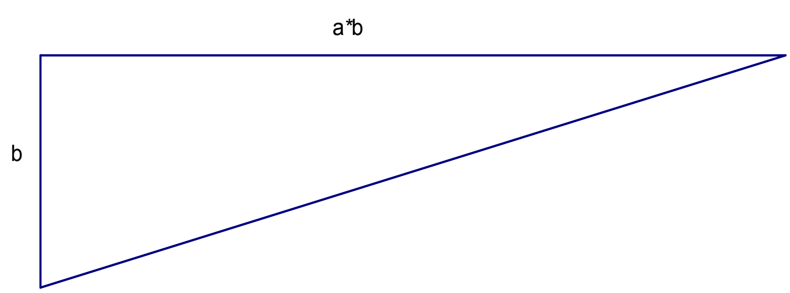


and another triangle similar to my first where a side noncorresponding to **a** was length **b**.



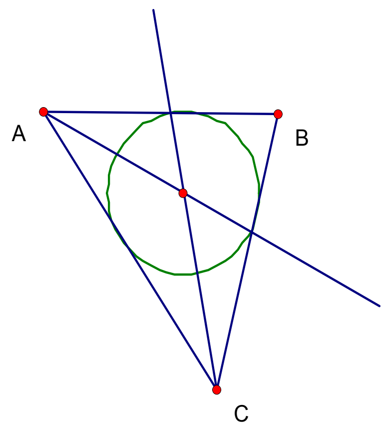
Then I could say that the side of my 1st triangle corresponding to **b** is of length 1 (or 1 unit) and the side corresponding to **a** on my second triangle is of length **ab**.



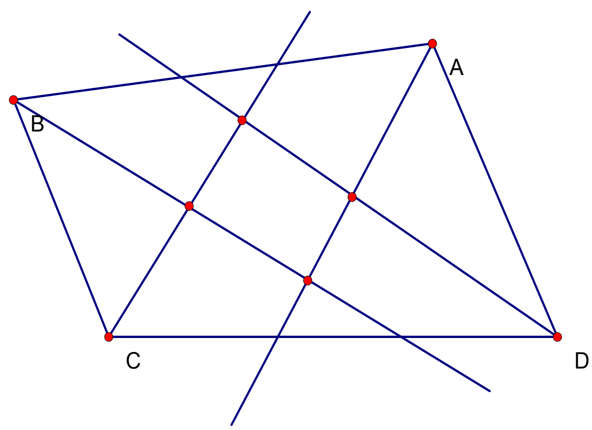


7. Given: Quadrilateral ABCD. Construct a point that is equidistant from all four sides.

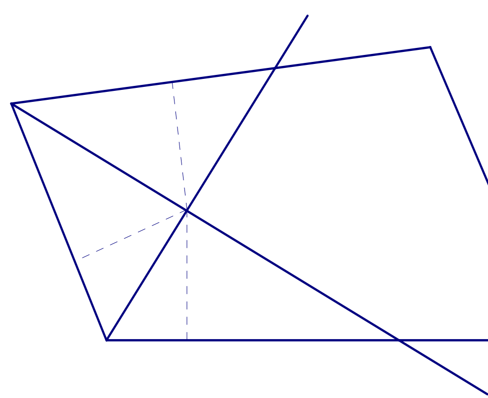
When we are given a triangle ABC, we can find the point equidistant from all three sides by finding the intersection point of two of the angle bisectors.



We can use the same line of thinking when approaching the quadrilateral problem. If we are given a Quadrilateral ABCD, we can find the angle bisectors.



We can see that any one of the 4 points where the angle bisectors meet show a point that is equidistant from three of the sides.



However, given any quadrilateral, such as the first one shown, it does not guarantee that all four bisectors will coincide at one point, which is what we need. If we measure the distance between the point and a side as the shortest distance from the point to the side then we can conclude that given any quadrilateral ABCD we can not necessarily find a point that is equidistant from all 4 sides. Yet, we can conclude that there will be certain quadrilaterals that have a point that is equidistant from all four sides and such a case will occur when all 4 angle bisectors coincide at one point.