The University of Georgia

Mathematics Education Program

J. Wilson, EMAT 6600

Squaring a Rectangle

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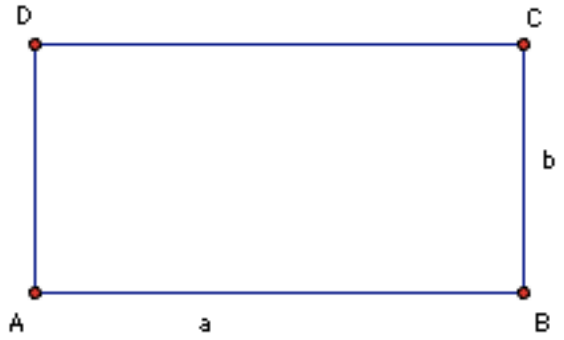
Goal: to construct a square with the same area as a given rectangle

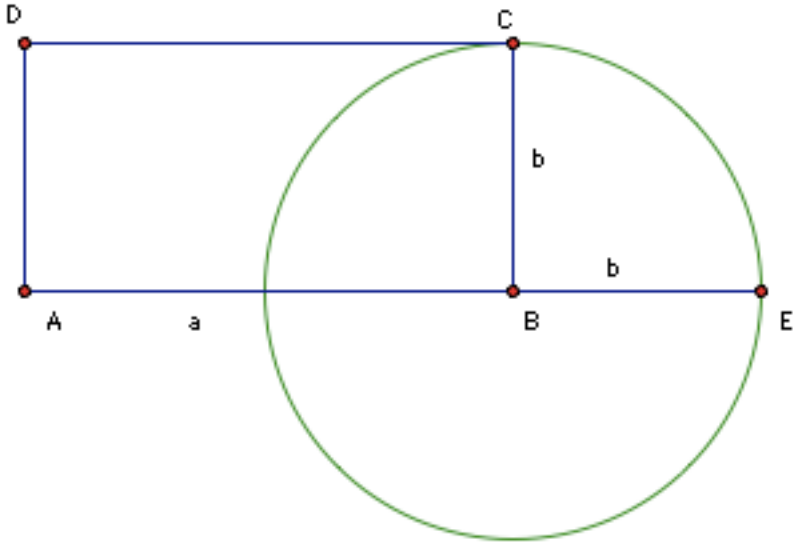
Problem

Given a rectangle with sides *a* and *b*, construct a square with the same area.

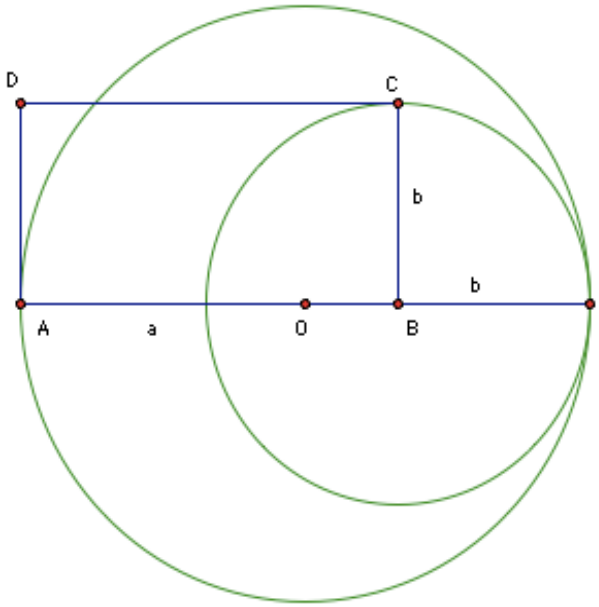
Solution



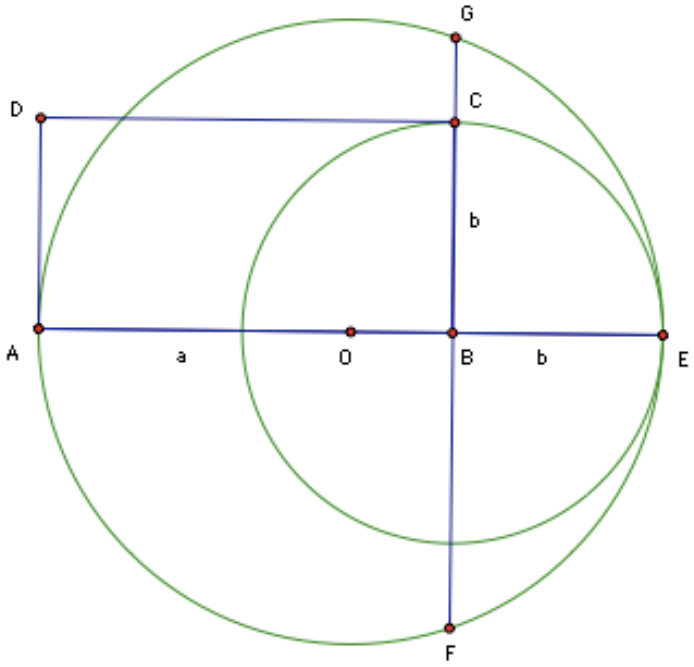
Given rectangle with sides a and b
Area = ab
We want to construct a square with the same area



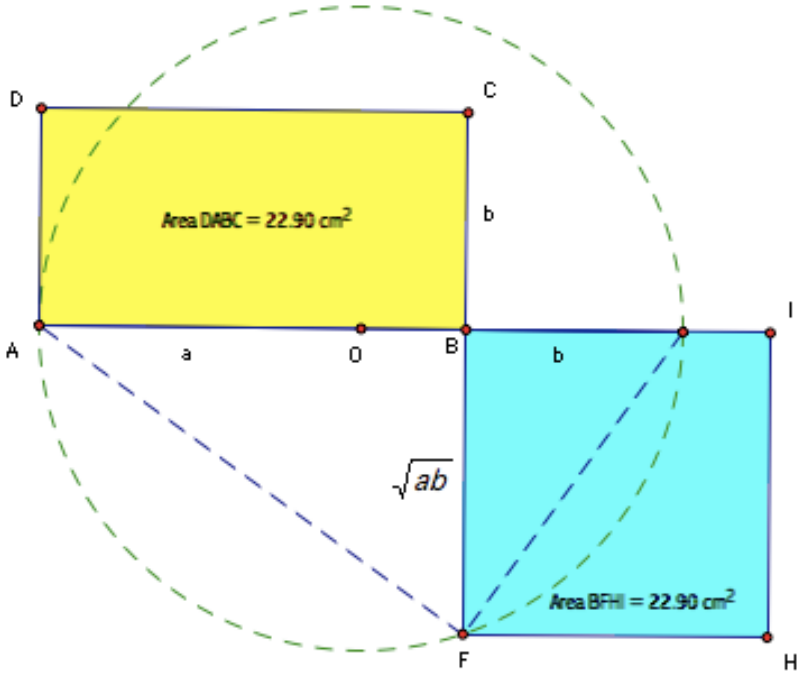
Construct an arc using length b as radius such that it intersects the extended segment a at point E



Construct midpoint of AE at O and then construct circle center O radius OA.



Extend line through segment BE to intersect circle O at points F and G



Construct square using BF as a side Now BF is the geometric mean of a and b by construction, that is $BF = \sqrt{ab}$ *So the square BFHI is the same area as the rectangle ABCD*