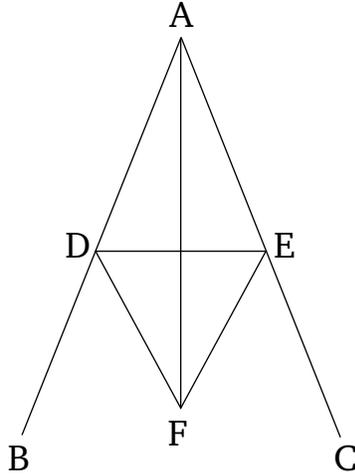


# Book 1

## Proposition 9

To cut a given rectilinear angle in half.



Let  $BAC$  be the given rectilinear angle. So it is required to cut it in half.

Let the point  $D$  have been taken at random on  $AB$ , and let  $AE$ , equal to  $AD$ , have been cut off from  $AC$  [Prop. 1.3], and let  $DE$  have been joined. And let the equilateral triangle  $DEF$  have been constructed upon  $DE$  [Prop. 1.1], and let  $AF$  have been joined. I say that the angle  $BAC$  has been cut in half by the straight-line  $AF$ .

For since  $AD$  is equal to  $AE$ , and  $AF$  is common, the two (straight-lines)  $DA$ ,  $AF$  are equal to the two (straight-lines)  $EA$ ,  $AF$ , respectively. And the base  $DF$  is equal to the base  $EF$ . Thus, angle  $DAF$  is equal to angle  $EAF$  [Prop. 1.8].

Thus, the given rectilinear angle  $BAC$  has been cut in half by the straight-line  $AF$ . (Which is) the very thing

it was required to do.