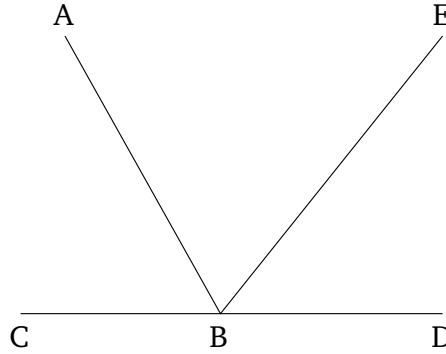


## Book 1

### Proposition 14

If two straight-lines, not lying on the same side, make adjacent angles (whose sum is) equal to two right-angles with some straight-line, at a point on it, then the two straight-lines will be straight-on (with respect) to one another.



For let two straight-lines  $BC$  and  $BD$ , not lying on the same side, make adjacent angles  $ABC$  and  $ABD$  (whose sum is) equal to two right-angles with some straight-line  $AB$ , at the point  $B$  on it. I say that  $BD$  is straight-on with respect to  $CB$ .

For if  $BD$  is not straight-on to  $BC$  then let  $BE$  be straight-on to  $CB$ .

Therefore, since the straight-line  $AB$  stands on the straight-line  $CBE$ , the (sum of the) angles  $ABC$  and  $ABE$  is thus equal to two right-angles [Prop. 1.13]. But (the sum of)  $ABC$  and  $ABD$  is also equal to two right-angles. Thus, (the sum of angles)  $CBA$  and  $ABE$  is equal to (the sum of angles)  $CBA$  and  $ABD$  [C.N. 1]. Let (angle)  $CBA$  have been subtracted from both. Thus, the remainder  $ABE$  is equal to the remainder  $ABD$

[C.N. 3], the lesser to the greater. The very thing is impossible. Thus,  $BE$  is not straight-on with respect to  $CB$ . Similarly, we can show that neither (is) any other (straight-line) than  $BD$ . Thus,  $CB$  is straight-on with respect to  $BD$ .

Thus, if two straight-lines, not lying on the same side, make adjacent angles (whose sum is) equal to two right-angles with some straight-line, at a point on it, then the two straight-lines will be straight-on (with respect) to one another. (Which is) the very thing it was required to show.