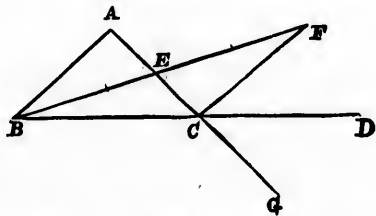


PROPOSITION XVI. THEOREM.

If one side of a triangle be produced, the exterior angle is greater than either of the interior opposite angles.



Let the side BC of $\triangle ABC$ be produced to D .

Then must $\angle ACD$ be greater than either $\angle CAB$ or $\angle ABC$.

Bisect AC in E , and join BE . I. 10.

Produce BE to F , making $EF = BE$, and join FC .

Then in $\triangle s BEA, FEC$,

$\therefore BE = FE$, and $EA = EC$, and $\angle BEA = \angle FEC$, I. 15.

$\therefore \angle ECF = \angle EAB$. I. 4.

Now $\angle ACD$ is greater than $\angle ECF$; Ax. 9.

$\therefore \angle ACD$ is greater than $\angle EAB$,

that is, $\angle ACD$ is greater than $\angle CAB$.

Similarly, if AC be produced to G it may be shewn that

$\angle BCG$ is greater than $\angle ABC$.

and $\angle BCG = \angle ACD$; I. 15.

$\therefore \angle ACD$ is greater than $\angle ABC$.

Q. E. D.

Ex. 1. From the same point there cannot be drawn more than two equal straight lines to meet a given straight line.

Ex. 2. If, from any point, a straight line be drawn to a given straight line making with it an acute and an obtuse angle, and if, from the same point, a perpendicular be drawn to the given line; the perpendicular will fall on the side of the acute angle.