Trisection of a Rectilineal Angle.

Let B O C be the angle to be trisected.

At the point O, make (23.1) the angles B O D and C O E, each equal to the angle B O C. Take O as centre with any radius O B, and describe the arc D B C E; join D B, B C, C E, and D E. Produce D B, and E C to meet in T; join O T. By 4.1., the angle O D B is equal to the angle O E C, and (5.1) the angle O D E is equal to the angle O E D; take away the two latter angles and the remaining angles E D T and D E T are equal: therefore (6.1) D T is equal to E T. In the triangles O D T and O E T, the three sides of the one are respectively equal to the three sides of the other, by (8.1) they are equal in every respect; therefore the angle D T O is equal to the angle E T O, then the line O T bisecting the vertical angle of an isosceles triangle, bisects D E and B C perpendicularly. It also bisects the arc B C; it is evident by 4.1 that D B, B C, and C E are equal to one another.

Draw *a d* parallel to B C, so that *a d* shall be equal *a* B and *d* C. This is done by bisecting the angles T B C and T C B by lines meeting the sides B T and C T in *a* and *d*, when the triangle is isosceles, or equilateral and proved by (29.1, 6.1, and 4.1). Find the diamater of a circle circumscribing the trapizium B *a d* C, and make *t* L equal to it; join *a* L and *d* L, cutting the arc B C in the points *r* and *l*: these are the trisecting points of the arc B C which is t measure of the given angle B O C. Draw the lines O *r b* ard O *l c*, and the three angles *b* O *c*, *b* O B, and C O *c* are equal and each equal to one third of the given angle B O C.