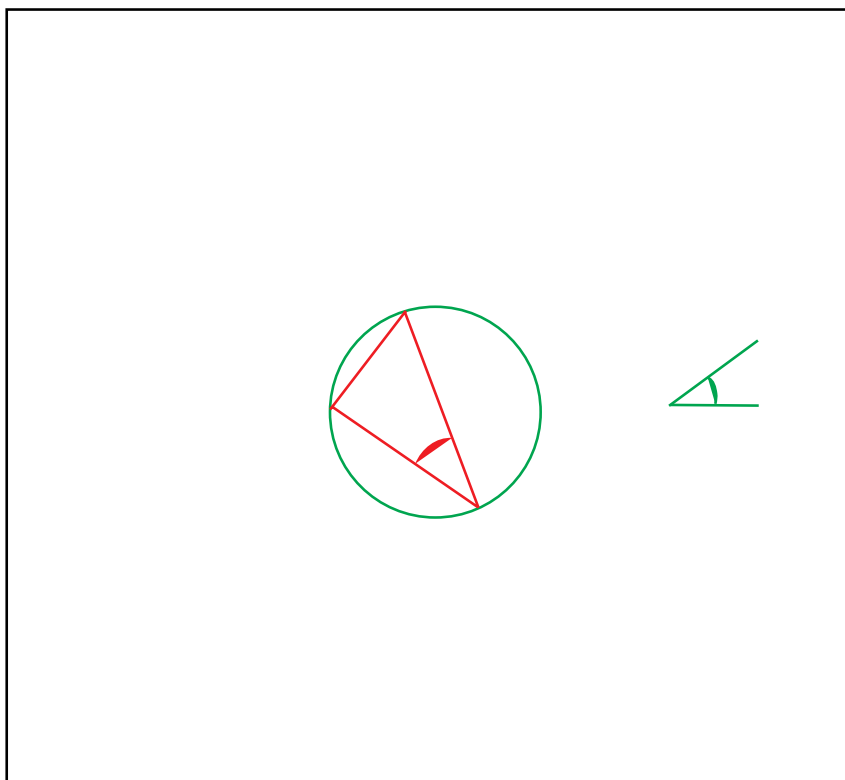
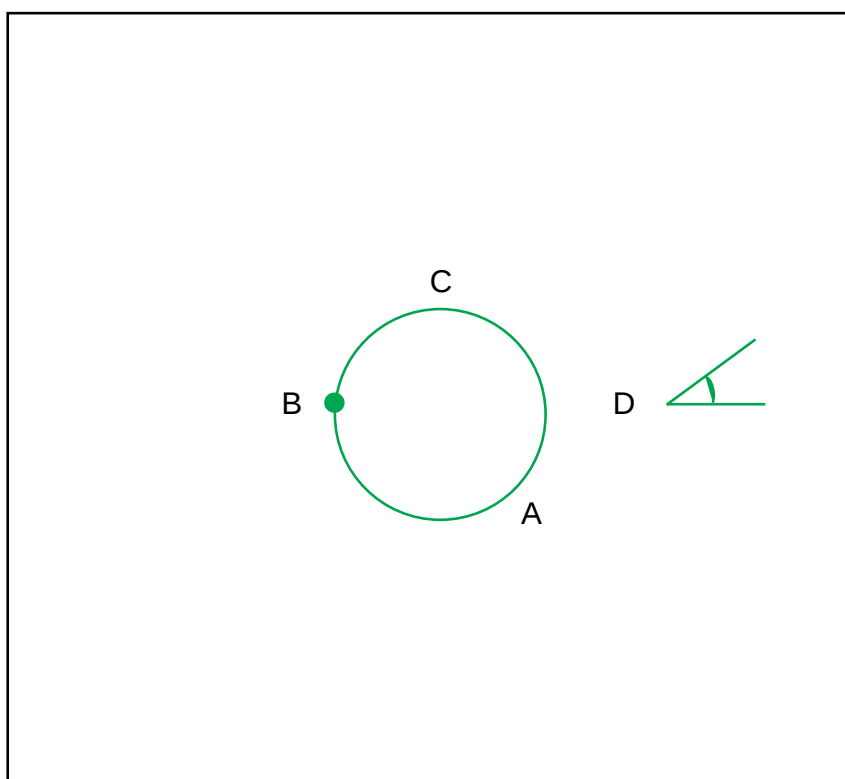


Construction 22: Book III, Proposition 34

*log*From a given circle to cut off a segment admitting an angle equal to a given rectilineal angle.



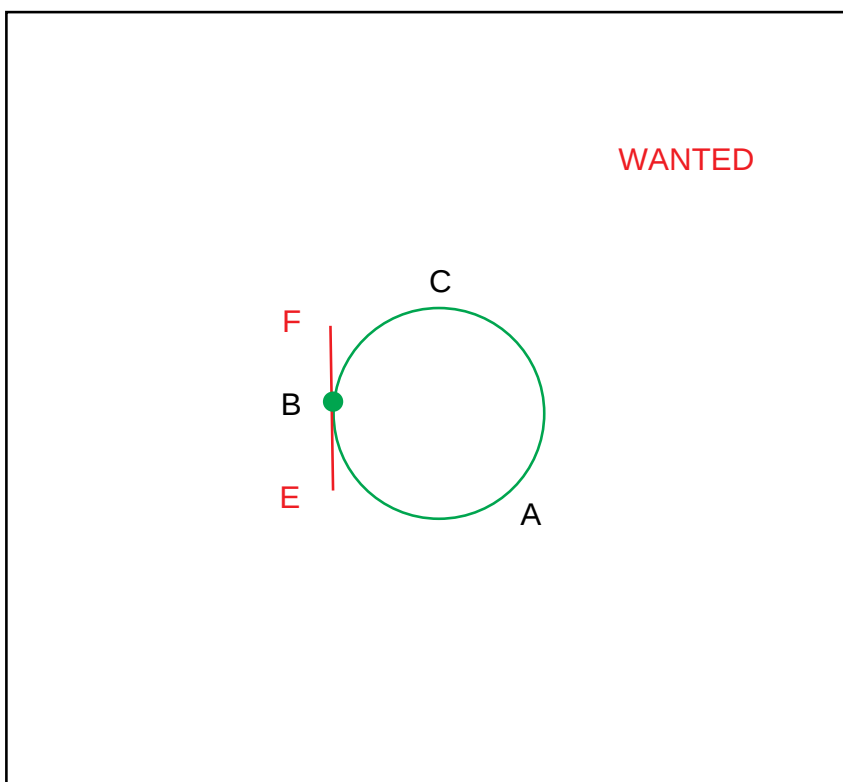
III.34:3. Let ABC be the given circle, and the angle at D the given rectilineal angle; (the points A, C are not exactly given yet.)



III.34:8. Let EF be drawn touching ABC at the point B, ([III.17], special case.)

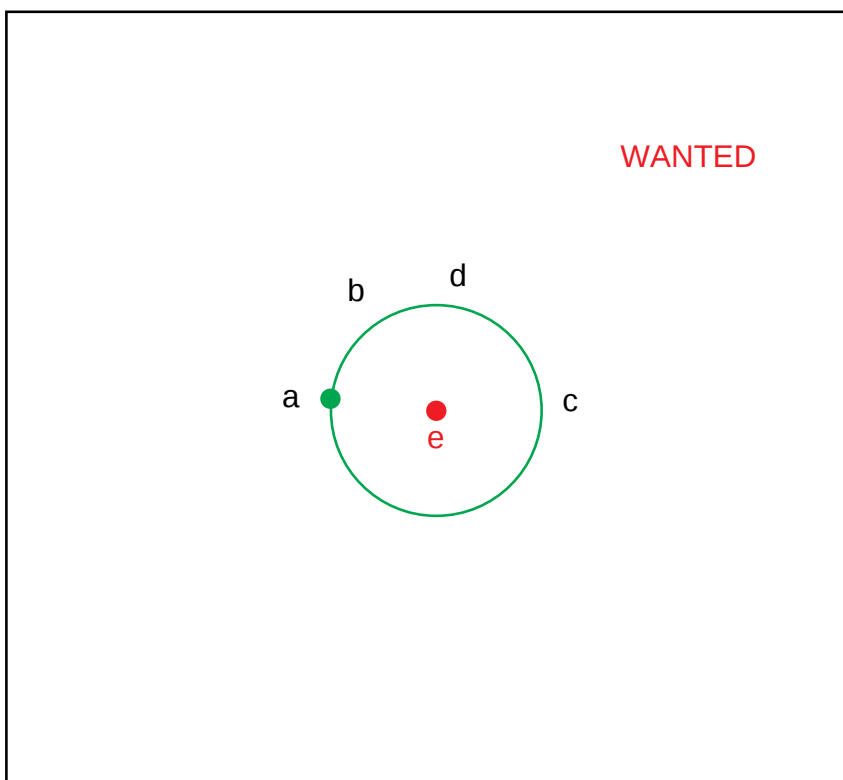
GOSUB III.17.

Relabel. Note that the point a is on the circle bcd.

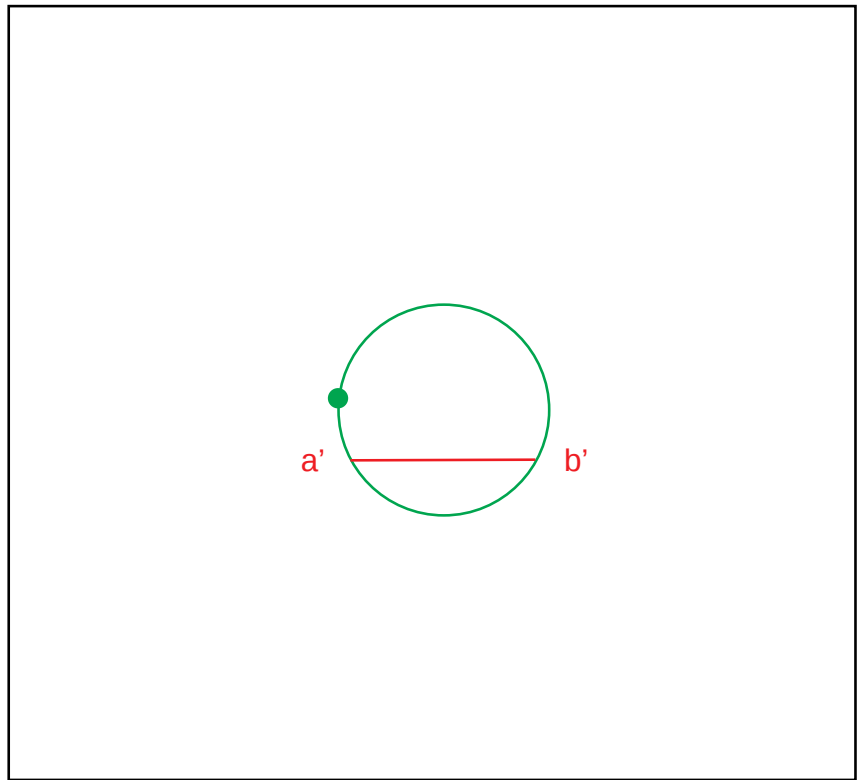


III.17:6. For let the centre e of the circle bc be taken; [III.1]

GOSUB III.1.
Relabel.

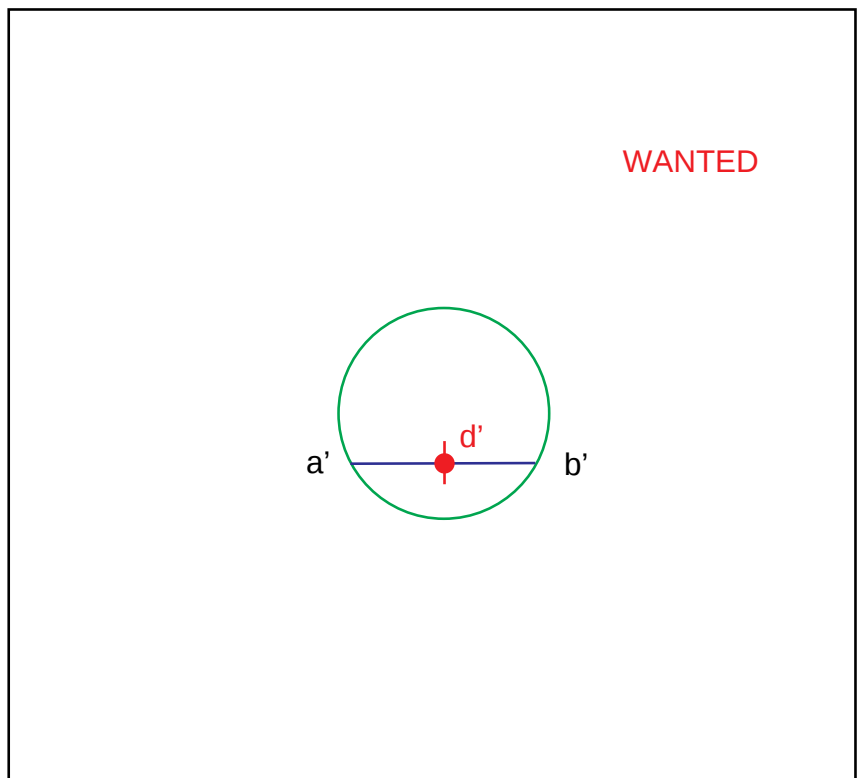


III.1:4. Let a straight line $a'b'$ be drawn through it at random,

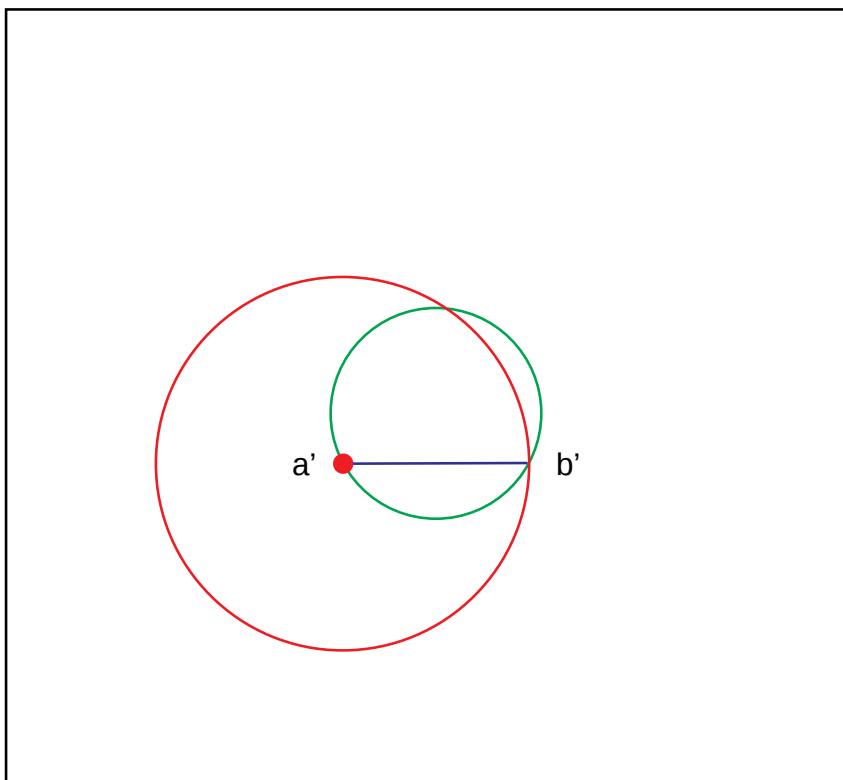


III.1:5. and let it be bisected at the point d' ; ([I.10])

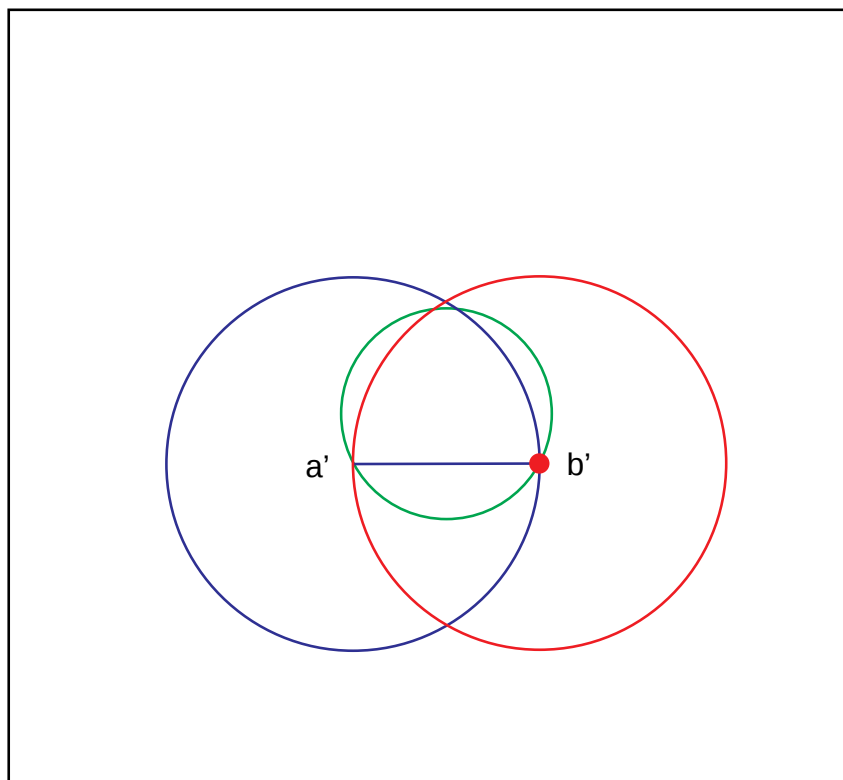
GOSUB I.10. (C#5B).



Swing $a'b'$ around a' .

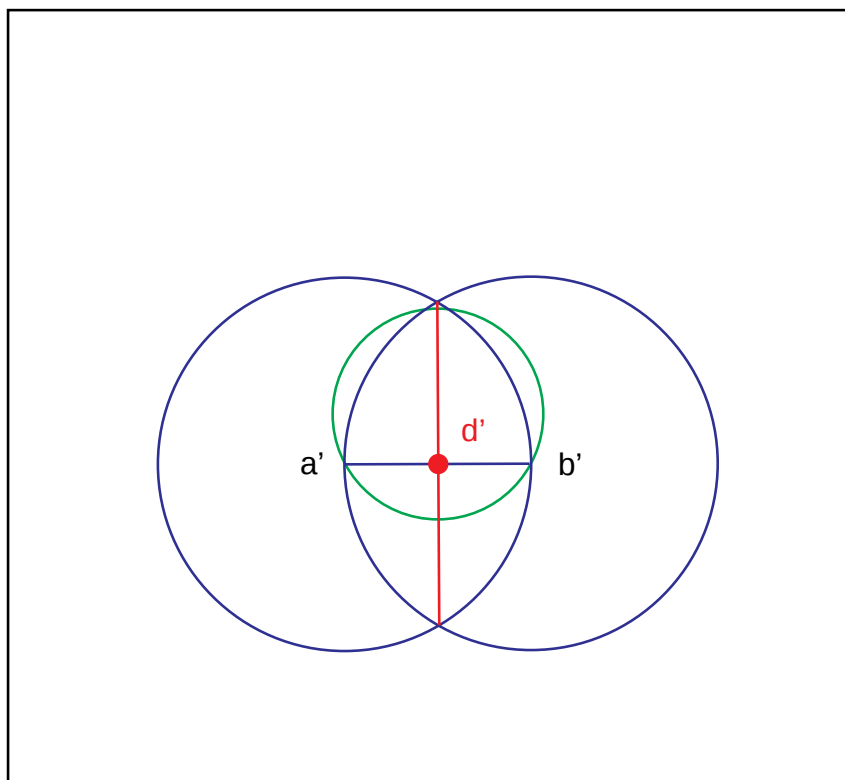


Swing $b'a'$ around b' .

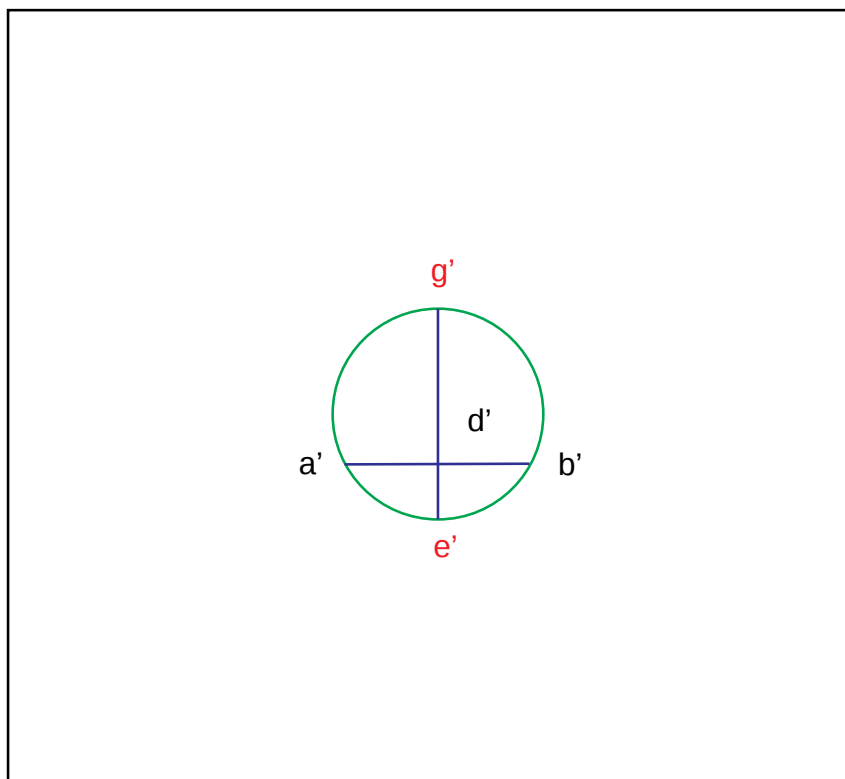


Connect the crossing points.
Mark the point d' .

RETURN to III.1 at line 5.
Relabel.



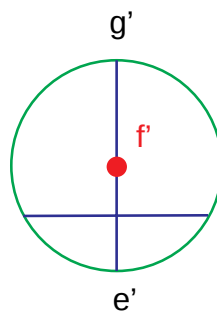
III.1:7. from d' let $d'g'$ be drawn
at right angles to $a'b'$ and let it
be drawn through to e' ;
(This is the line drawn in step 4,
so mark the points g' , e').



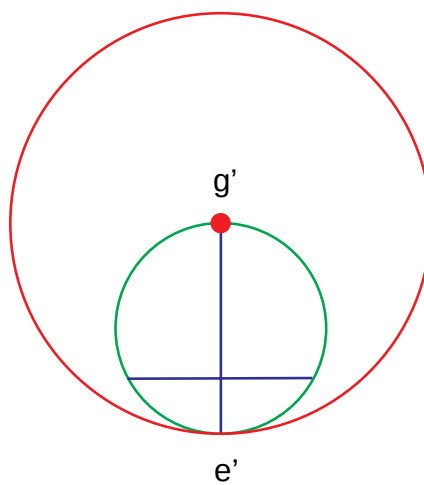
III.1:9. let $g'e'$ be bisected at f ;
 ([I.10])

GOSUB C#5B, again.

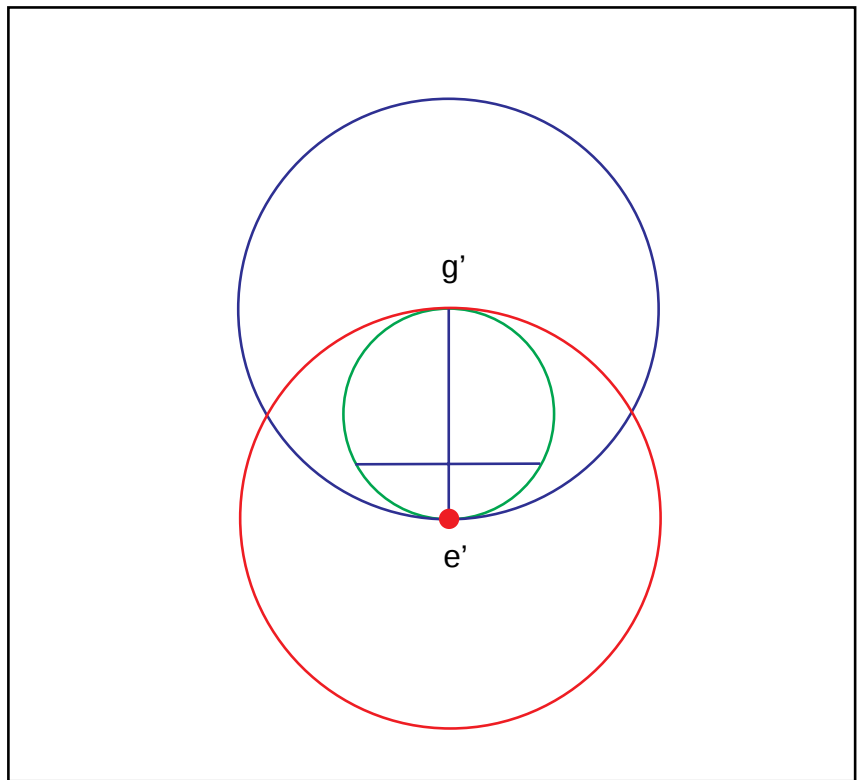
WANTED



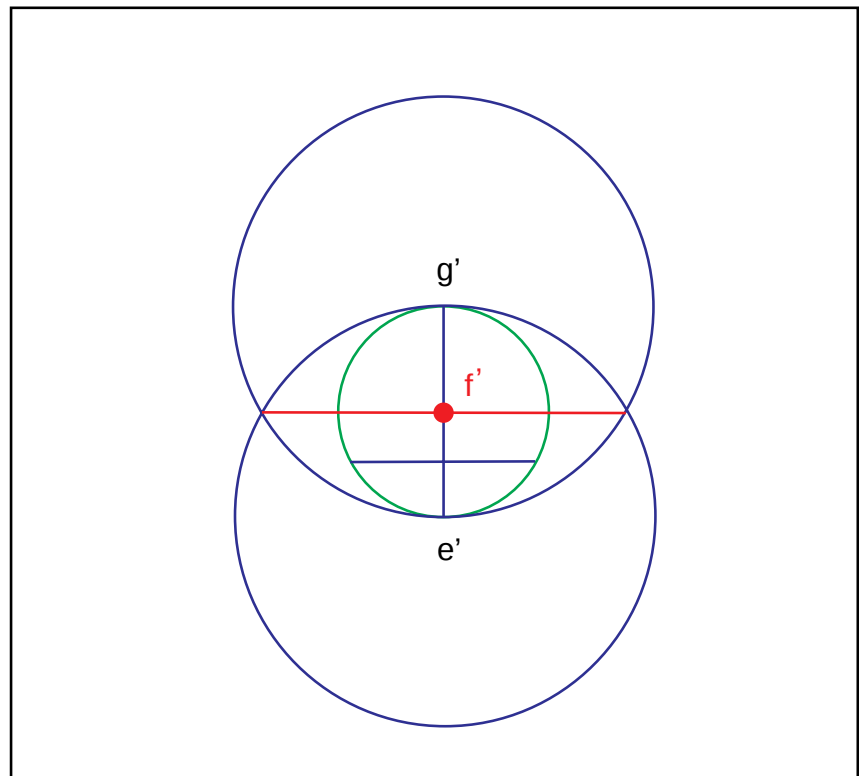
Swing $g'e'$ around g' .



Swing $e'g'$ around e' .

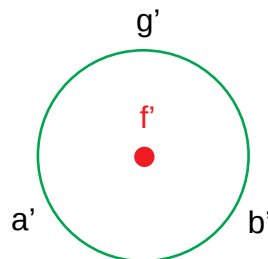


Connect the crossing points,
mark the point, f' .



Cleanup.
RETURN to III.1 at line 9.

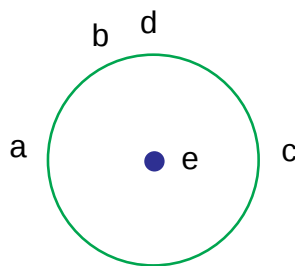
III.1:10. f' is the center of the circle $a'b'g'$.



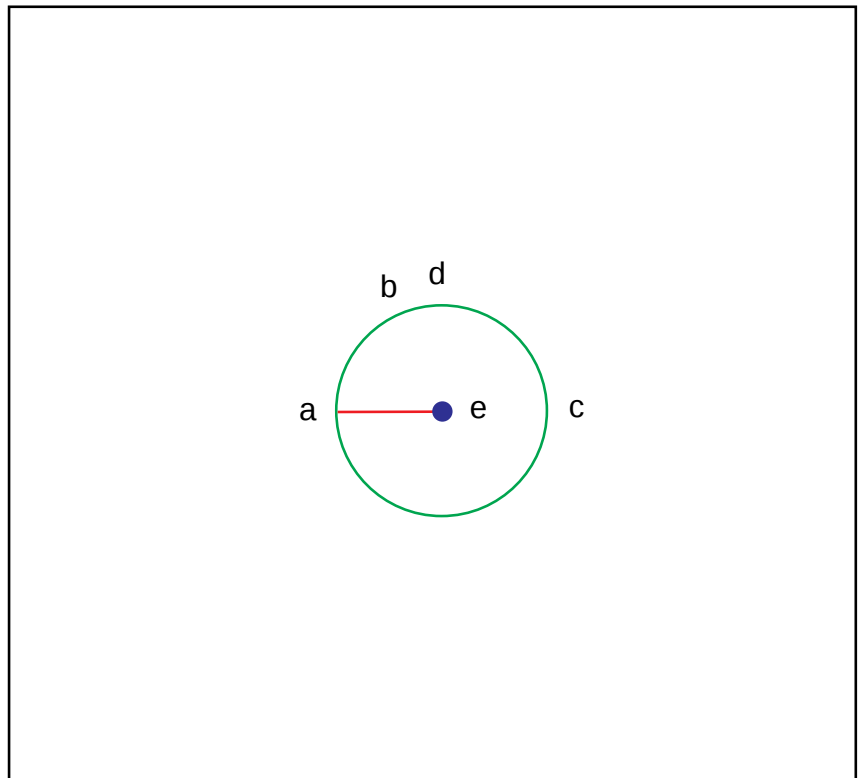
RETURN to III.17 at line 6.
Relabel.

Summary.

The point e is the centre of the circle bcd . The point a is on the circle. Recall that this is a special case of III.17.



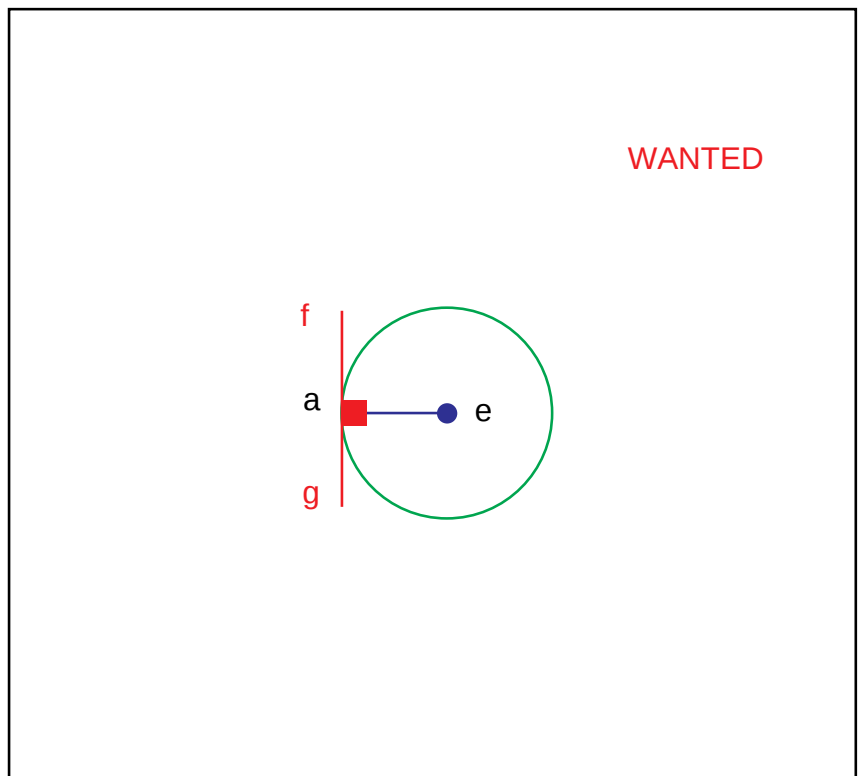
III.17:8. Let ae be joined,



Now we diverge from III.17. The line which is wanted is the perpendicular to ae at the point a . See the Porism to III.16.

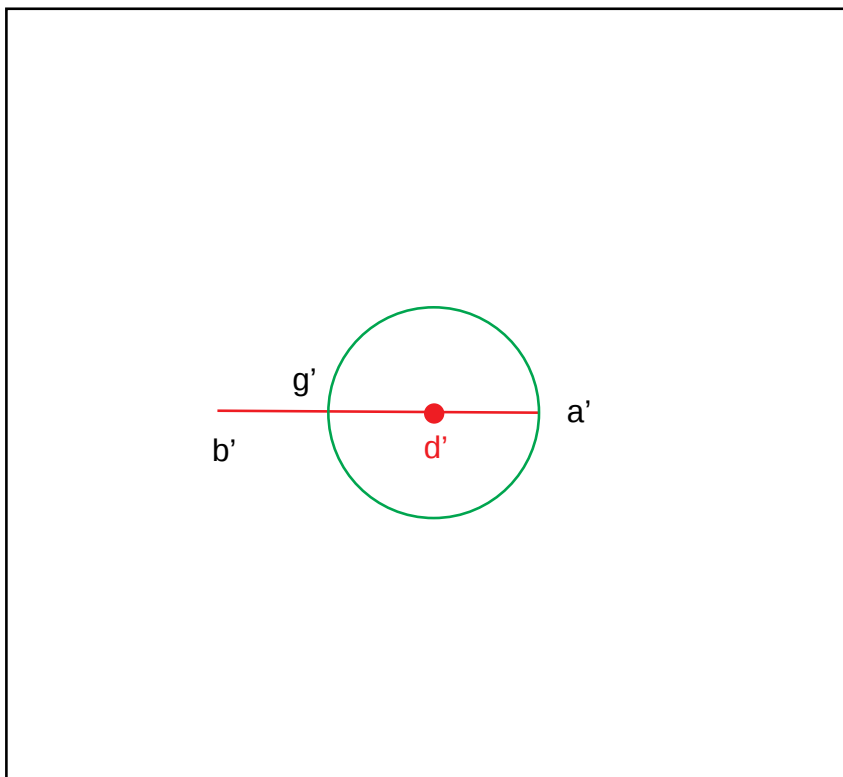
Draw a straight line fg at right angles to ae from the point a on it. ([I.11])

GOSUB I.11.

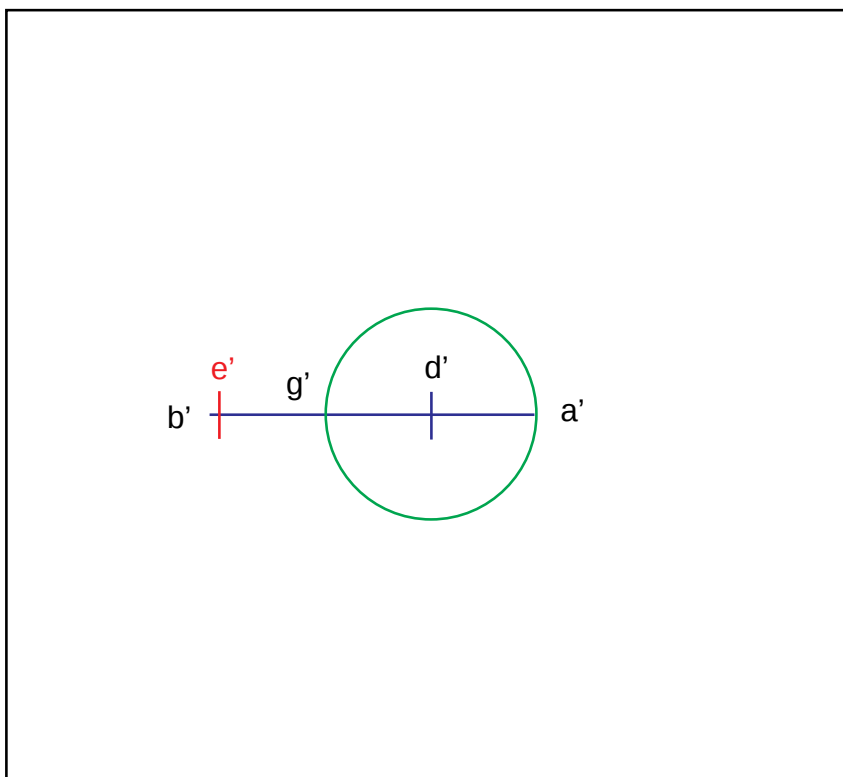


Extend the straight line ae .
Relabel.

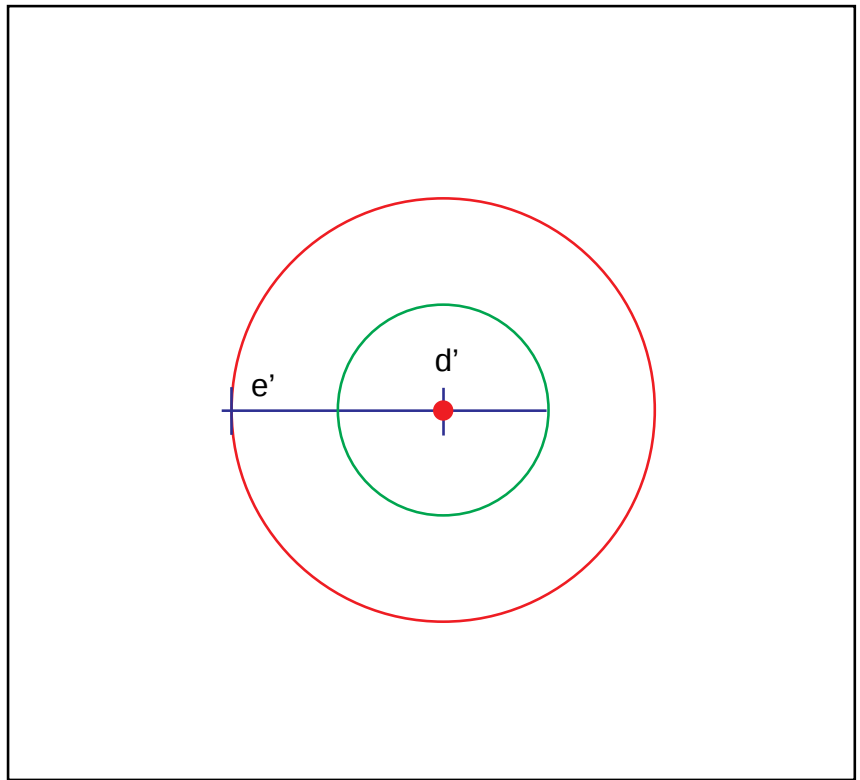
I.11:8. Let a point be taken at random on $a'g'$.
We take d' at the centre of the circle.



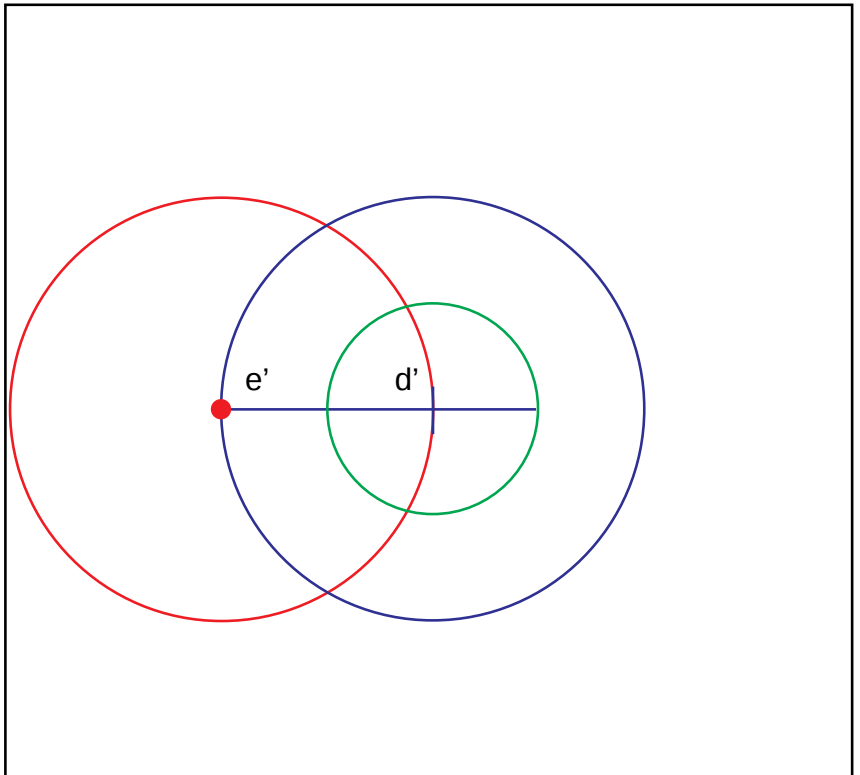
I.11:10. let $g'e'$ be made equal to $g'd'$; [I.3] (the rope)



Following C#5B, swing $d'e'$ around d' .

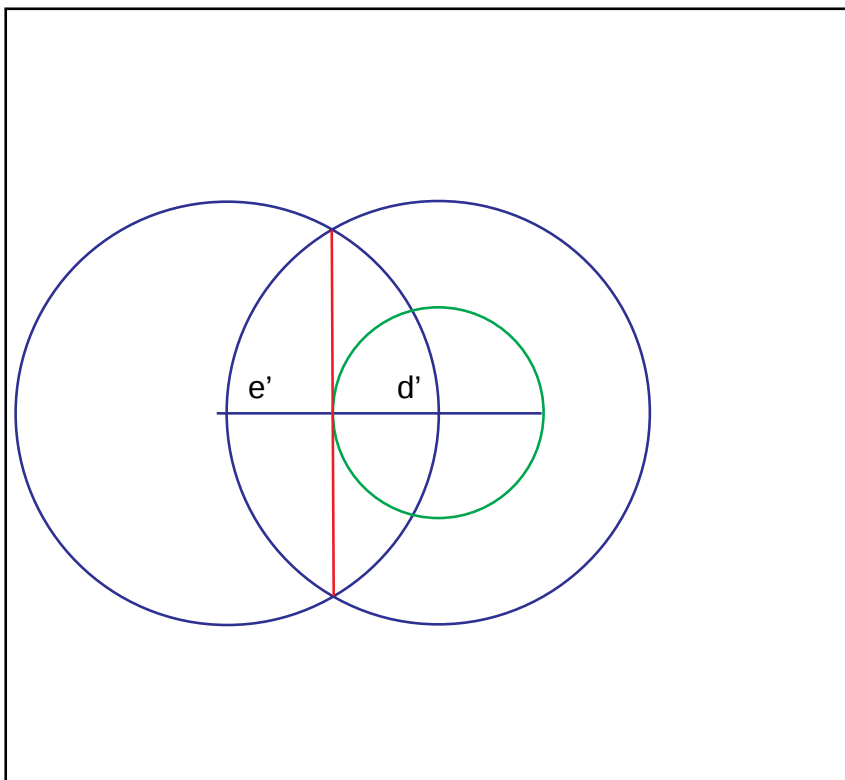


Swing $e'd'$ around e' .

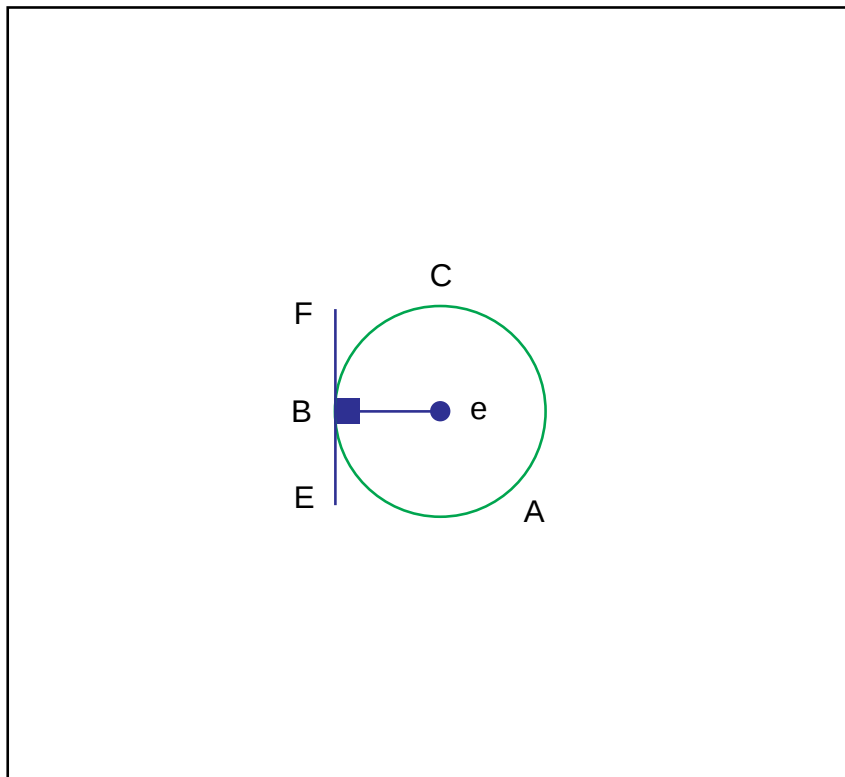


Connect the two crossing points.

Cleanup.
RETURN to III.17 variation.

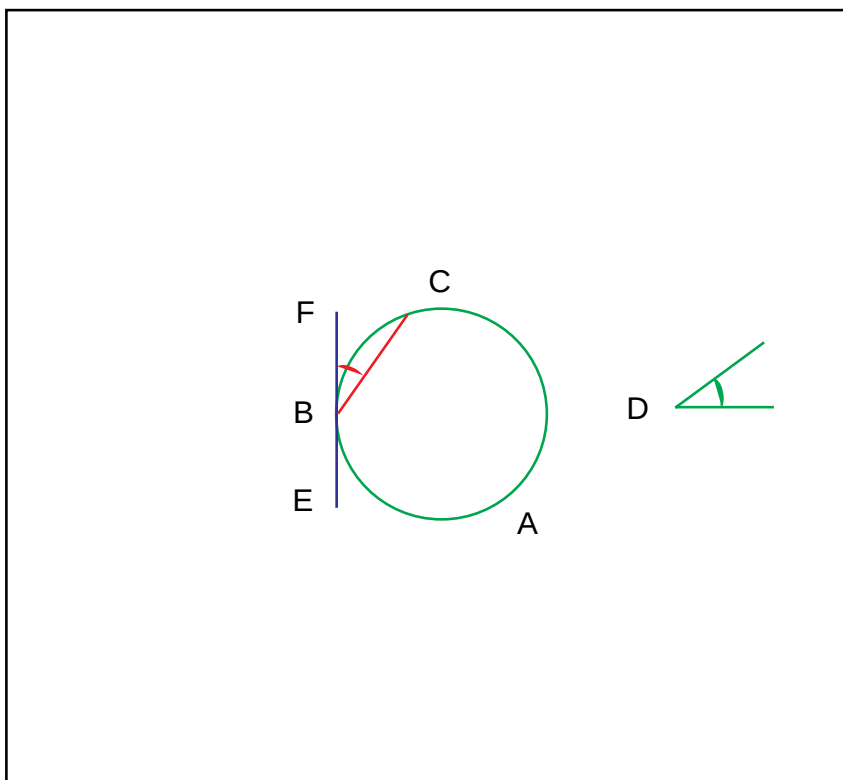


RETURN to III.34 at line 8.
Relabel.

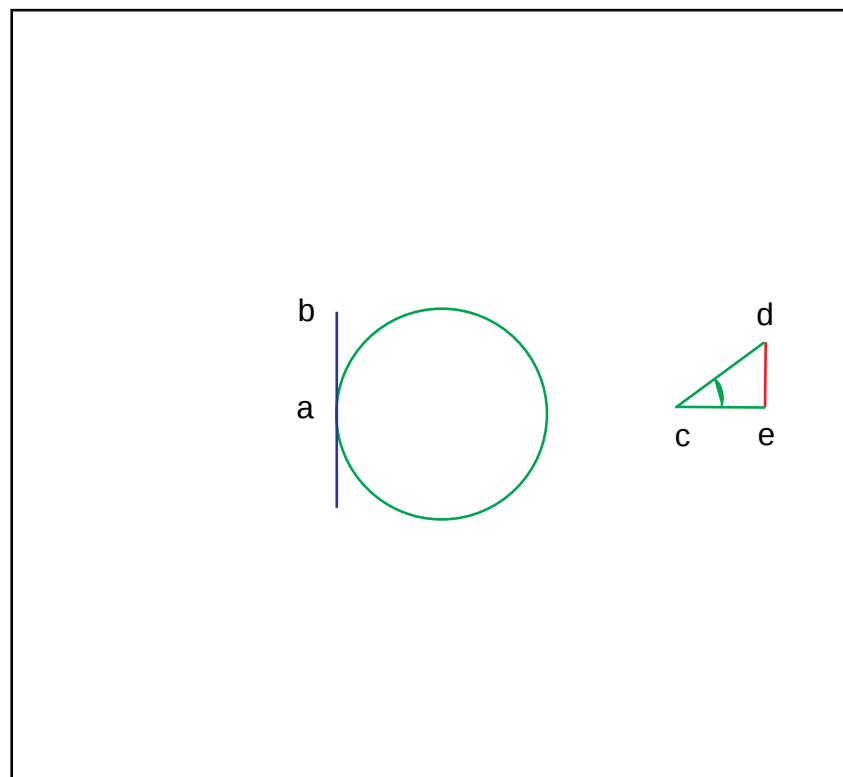


III.34:8. and on the straight line
FB, and at the point B on it, let
the angle FBC be constructed
equal to the angle at D.
[I.23]

GOSUB I.23.
Relabel.

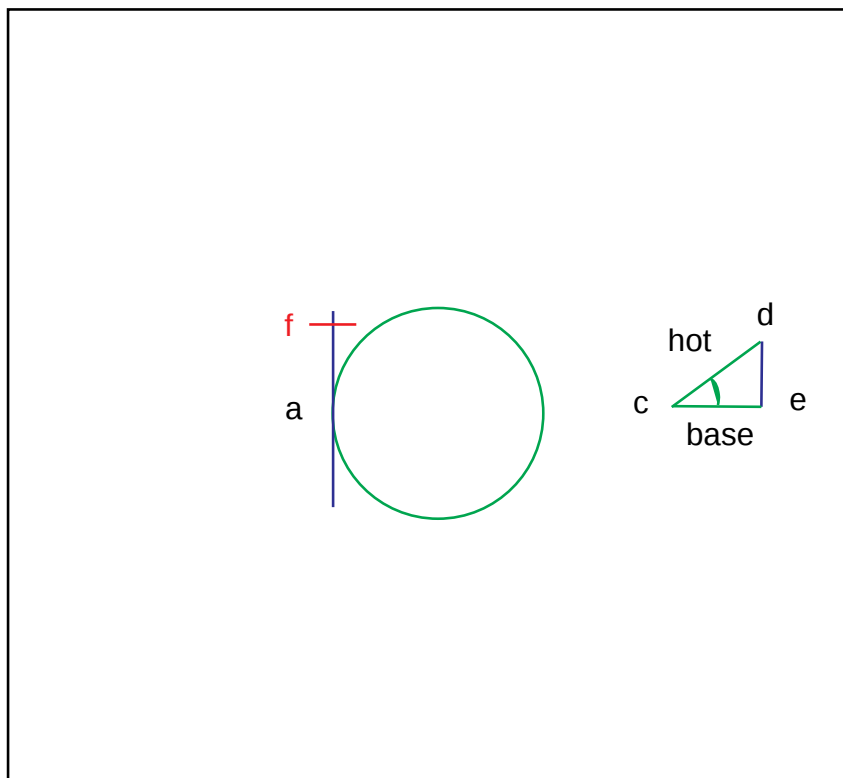


I.23:8. On the straight lines cd,
ce respectively let the points d, e
be taken at random;
let de be joined,

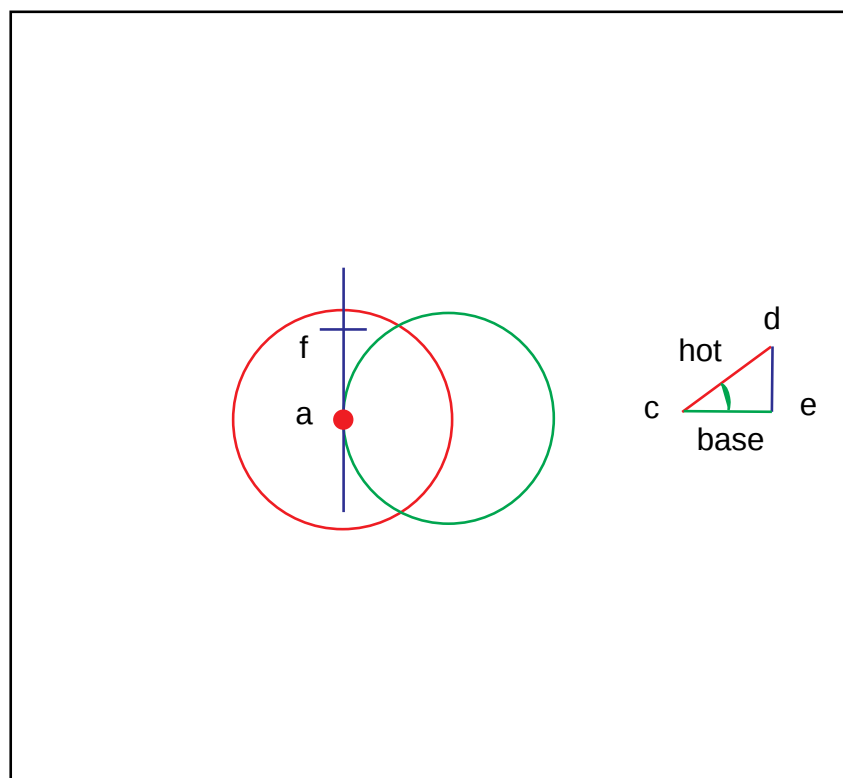


Move the triangle cde so that the base ce moves to the target line ab.

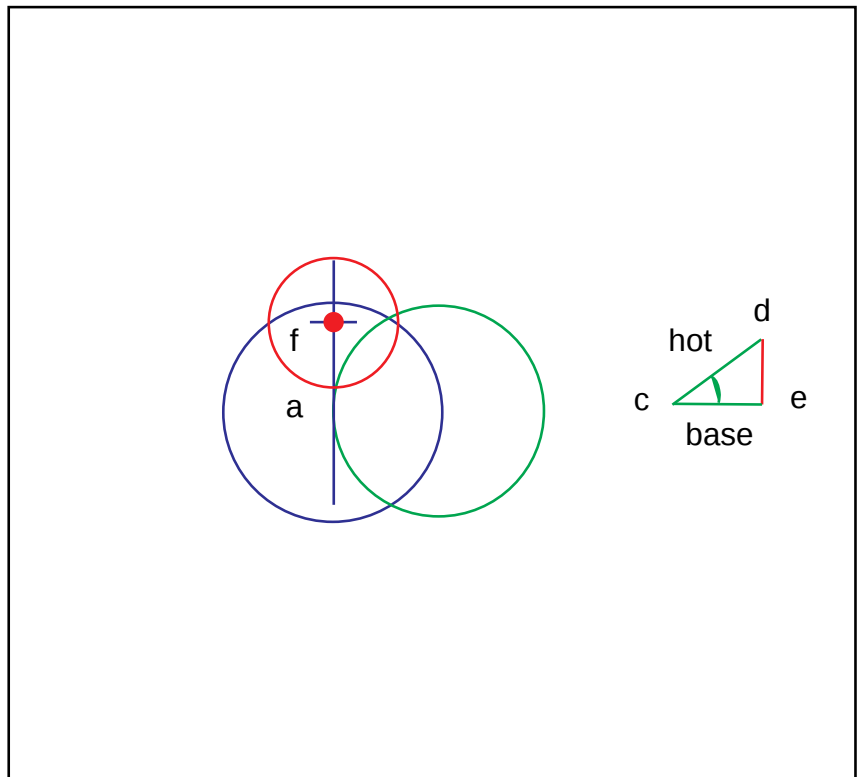
GOSUB I.22P.
Move the base. (dividers)



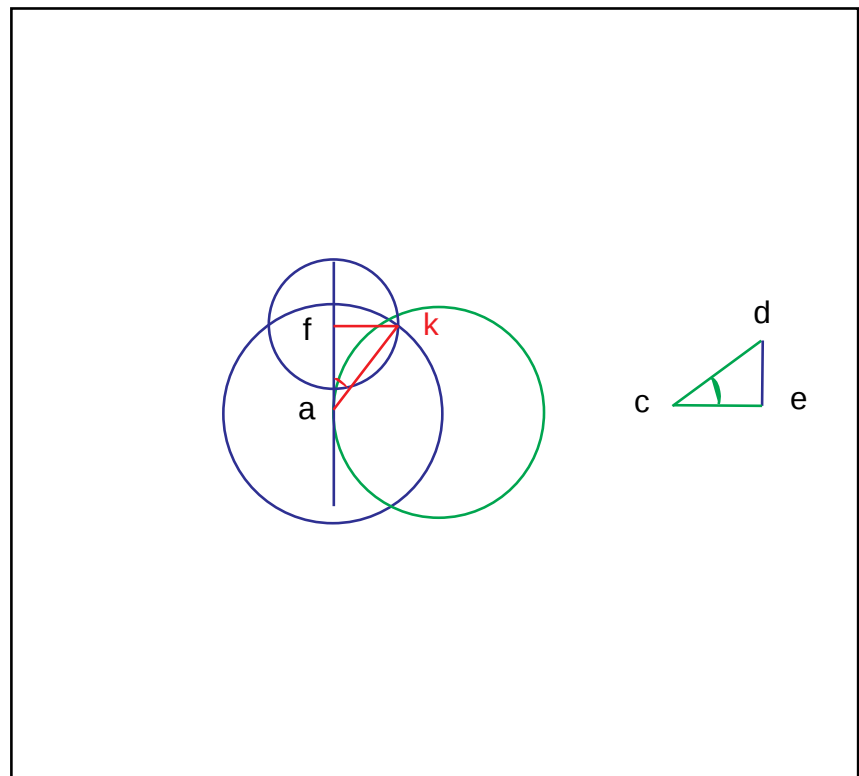
Swing the hot arm around a.



Swing the cold arm around f.



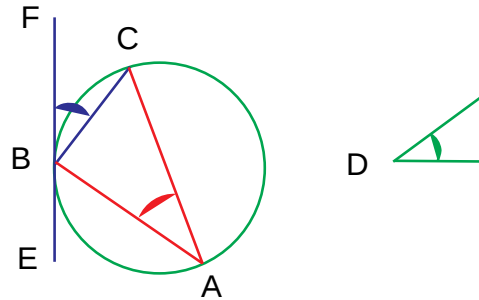
Connect the crossing point on the right, k, to the endpoints of the moved base, a, f.



Cleanup. Relabel.

RETURN to III.34 at line 8.

Let the point A be taken on the lower half of the circumference of the circle. Let AB, AC be joined.



III.34:17. The angle in the segment BAC is equal to the angle at D.

Q.E.F.

