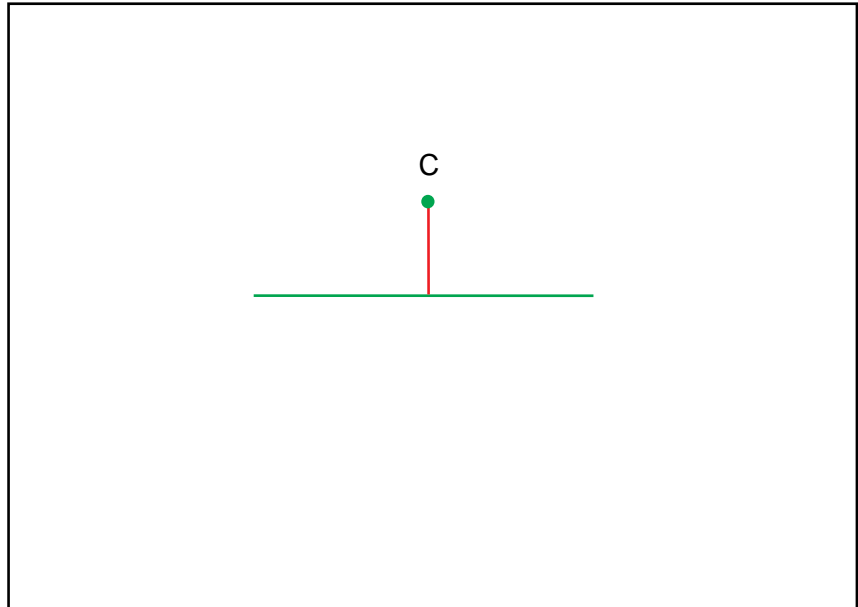
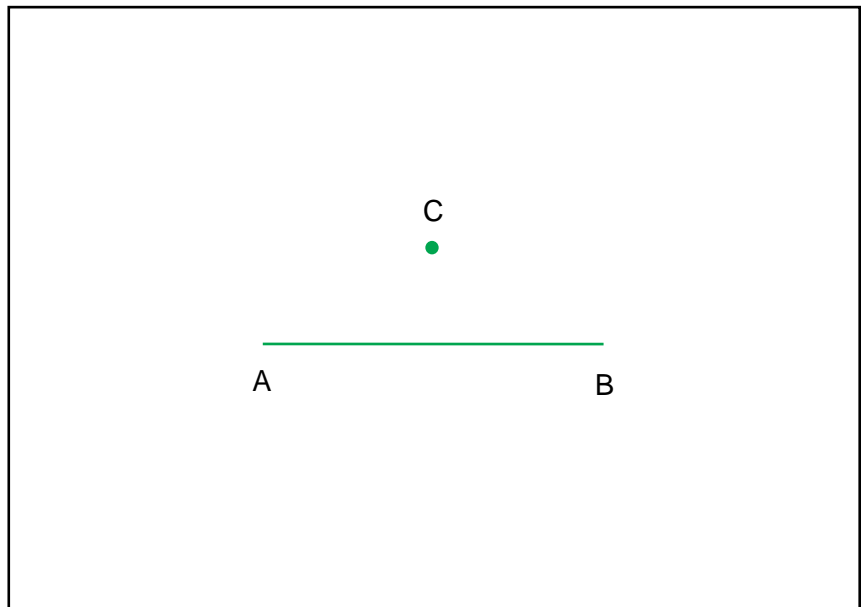

Construction 7: Book I, Proposition 12

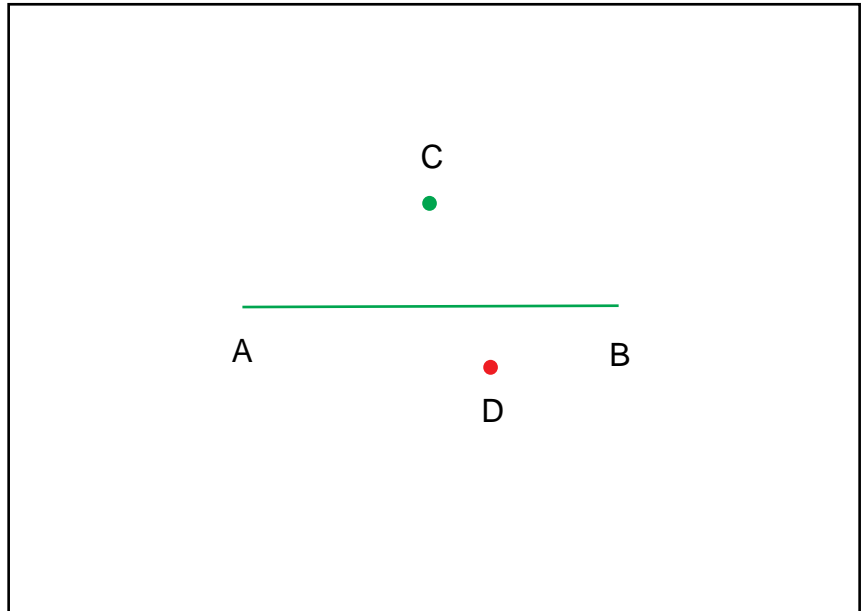
To a given infinite straight line, from a given point which is not on it, to draw a perpendicular straight line.



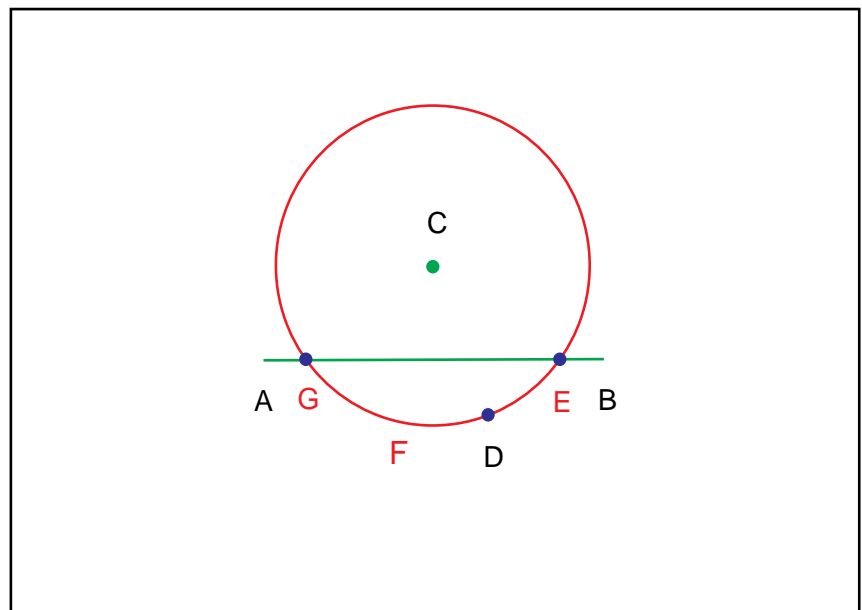
I.12:3. Let AB be the given infinite straight line, and C the given point which is not on it;



I.12:9. For let a point D be taken at random on the other side of the straight line AB,



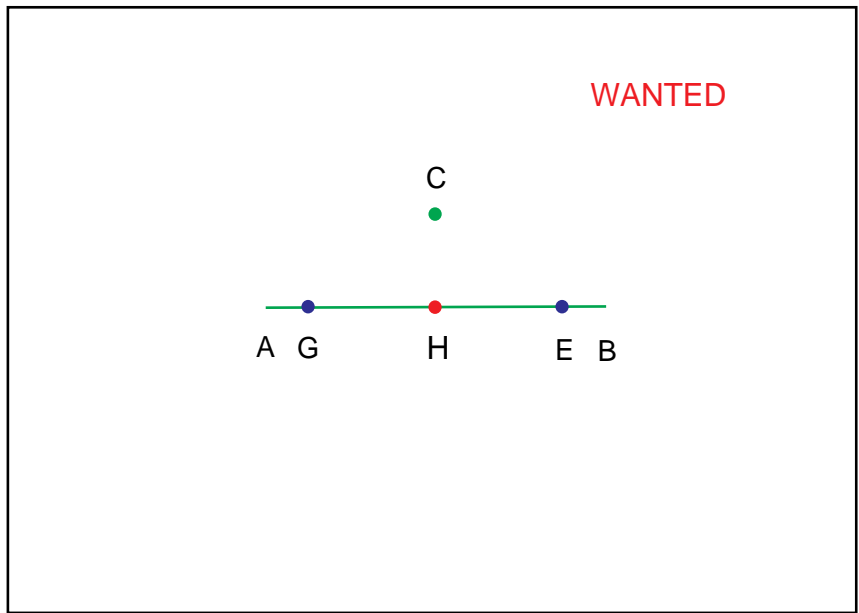
I.12:11. and with centre C and distance CD let the circle EFG be described; [Post. 3]



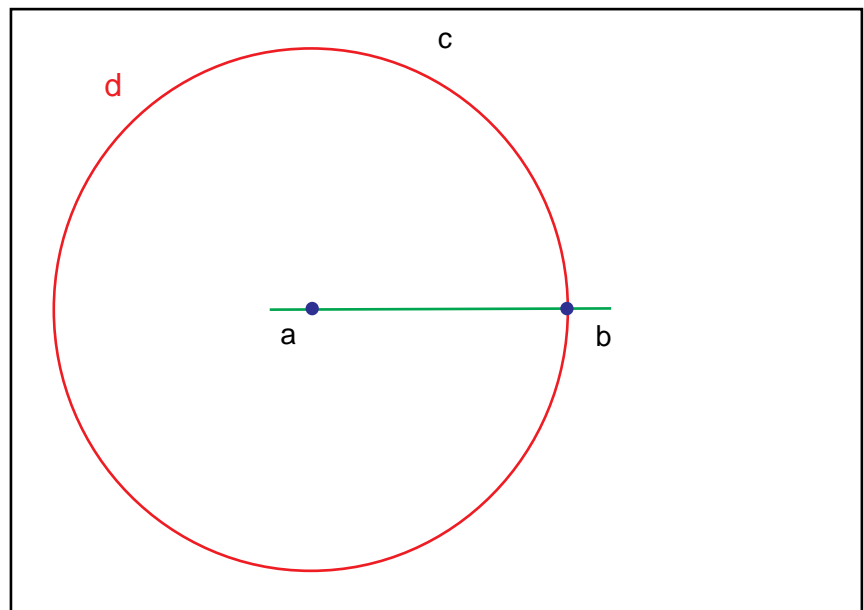
I.12:14. let the straight line EG be bisected at H, [I.10]

GOSUB I.10. Relabel EG as ab.
 I.10:4. Let the equilateral triangle abc be constructed on it, [I.1]

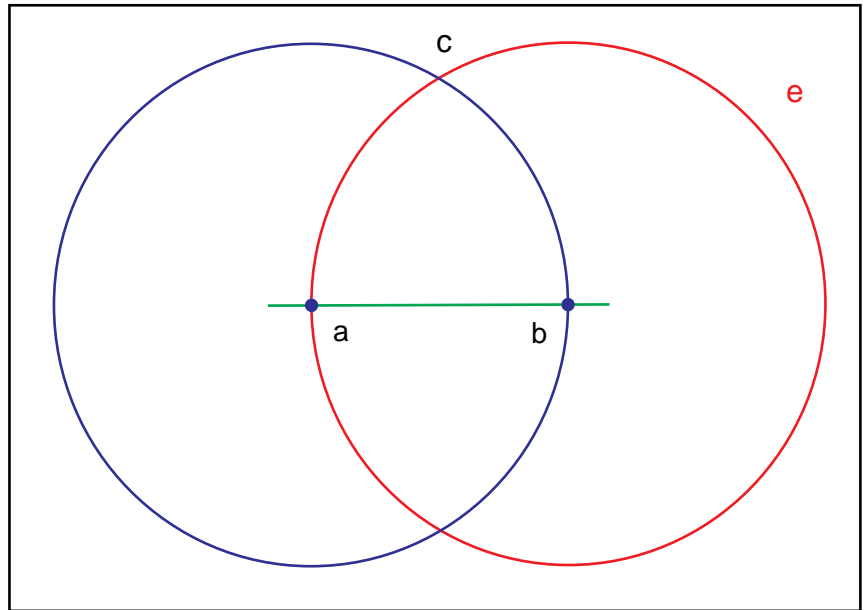
GOSUB I.1.



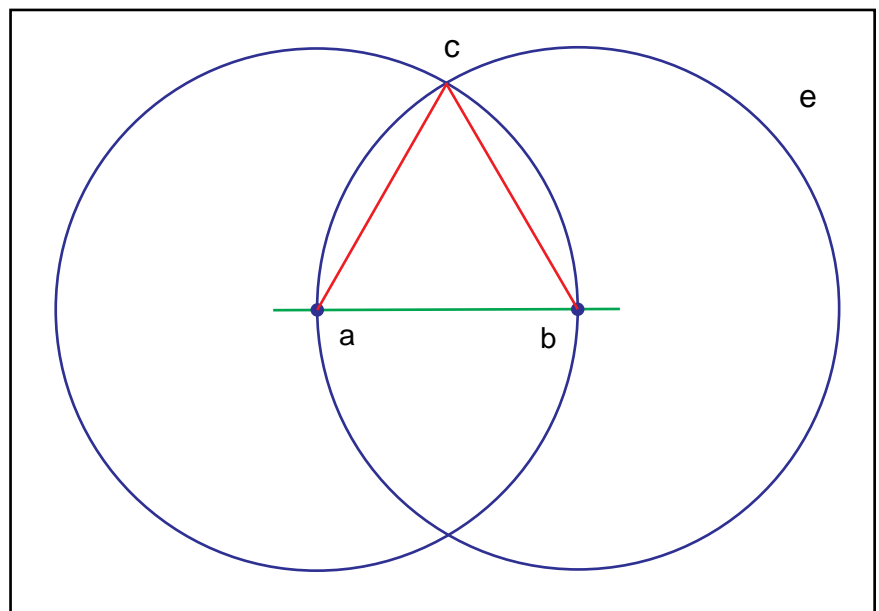
I.1:7. With centre a and distance ab let the circle bcd be described; [Post.3]



I.1:10. again, with centre b and distance ba let the circle ace be described; [Post.3]

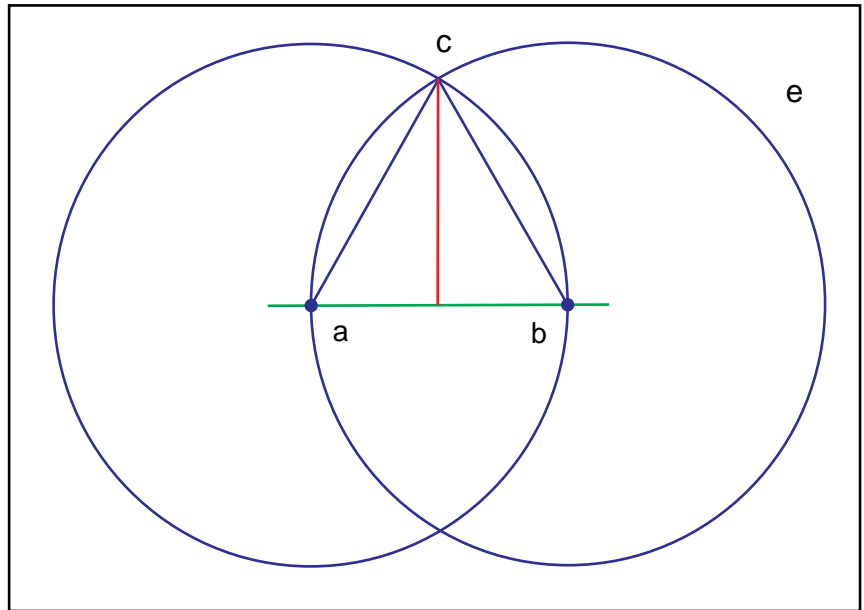


I.1:13. and from the point c, in which the circles cut one another, to the points a, b let the straight line ea, cb be joined. [Post. 1.]



Return to I.10 at line 4. I.10:6
 and let the angle acb be bisected
 by the straight line cd; [I.9]

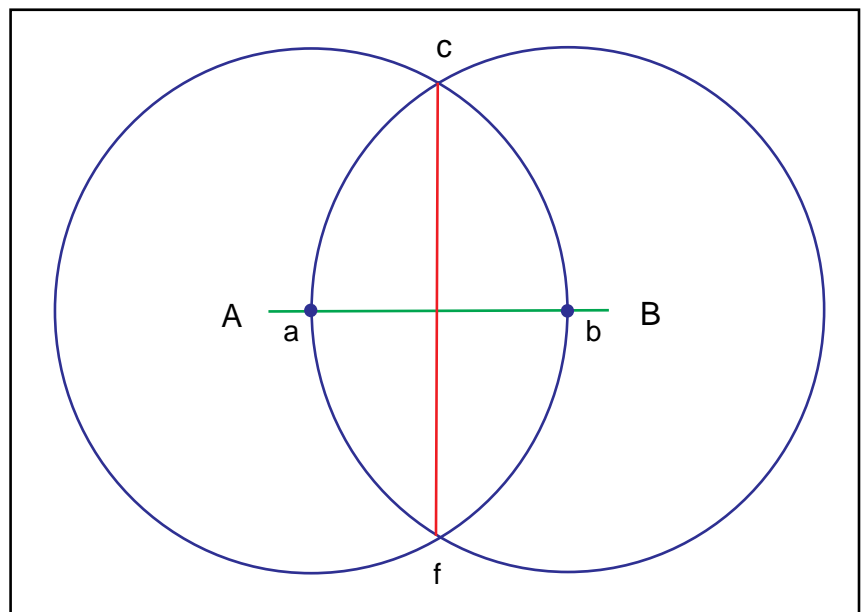
GOSUB I.9.



I.9:8. let cf be joined.

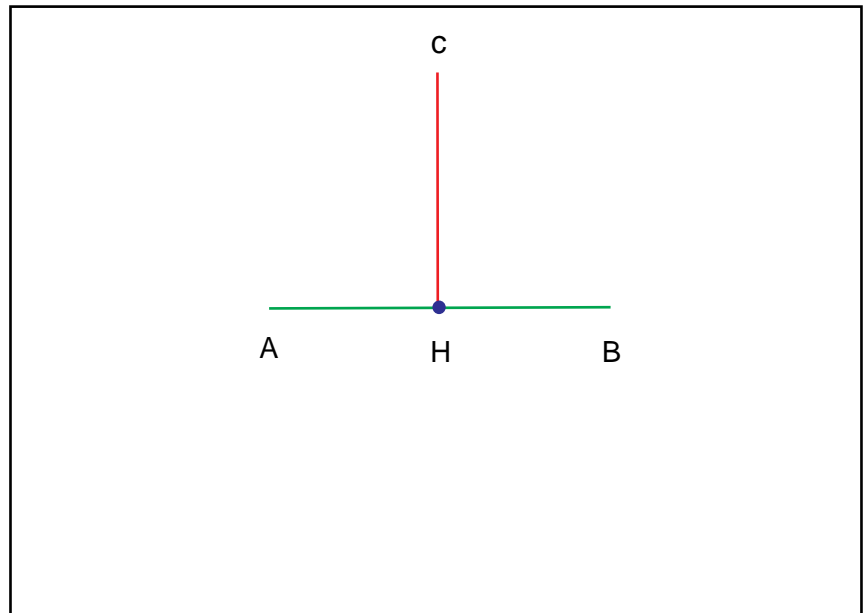
Here, e, f are the two points in
 which the circles cut one another.

RETURN to I.10.



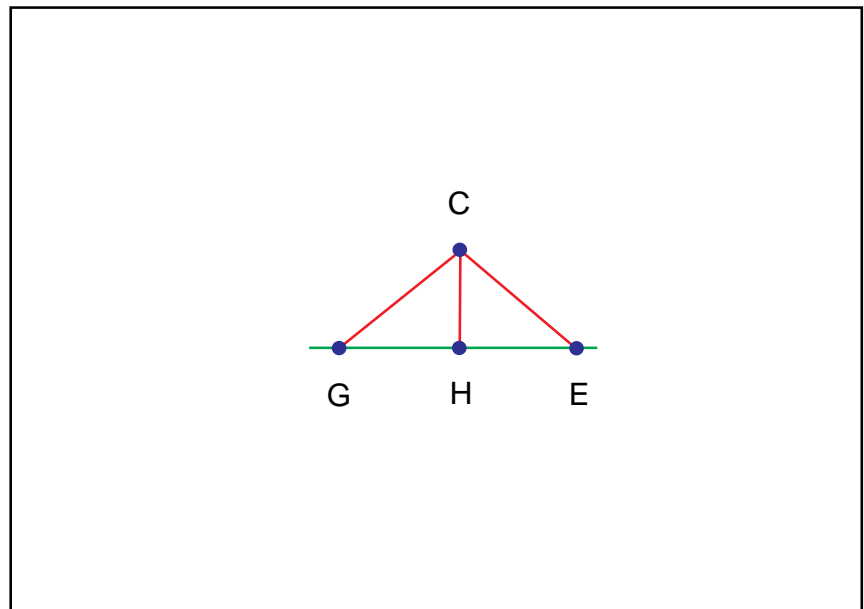
I.10:8. I say that the line ab has been bisected at the point d .

This is the point at which the line in step 5 cuts the line AB . We relabel this point H . Cleanup.
 I.1:10. again, with centre b and distance ba let the circle ace be described; [Post.3]



.12:16. and let the straight lines CG , CH , CE be joined. [Post. 1]

Actually, only CH is needed.



I.12:17. I say that CH has been drawn perpendicular to the given infinite straight line AB from the given point C which is not on it.

Q.E.F.

