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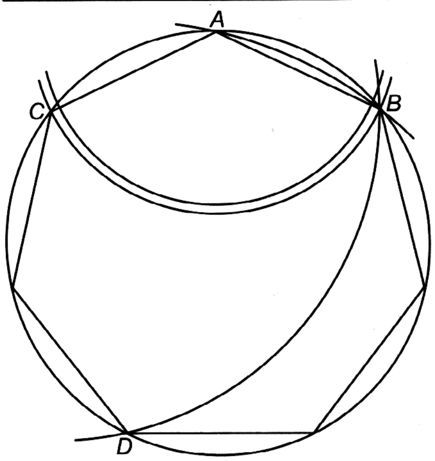

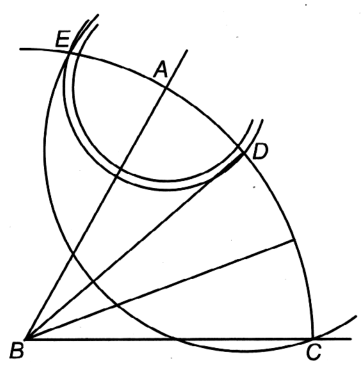

Last time here presented was a heptagon construction by means of straightedge and compass, utilizing “sliding” or “insertion”, a method that reaches a given point indirectly, in two or more steps instead of a single step. That heptagon depended, however, on factors that, though simpler than usual, were still quite intricate.

This time is shown that “insertion” can be used in a much simpler way, enabling construction of not only the heptagon but any other regular polygon, as well as division of an arbitrary angle into any number of equal parts, in results that appear unknown without the use of tools like the protractor.

For the above heptagon, with a center *A* on a circle draw a circular arc *BC* such that the last arc drawn meets *A*. By increasing the radius of arcs, the steps are reduced to a minimum. Here with center *C* arc *BD* is drawn, and with center *D* arc *BA*. The second figure concerns the famous problem of trisecting any angle. On angle *ABC*, with center *A* draw an arc *DE* such that with center *D* the arc from *E* meets *C*.

More work by the author, Paul Vjecsner, is on his website, http://vjecsner.net.

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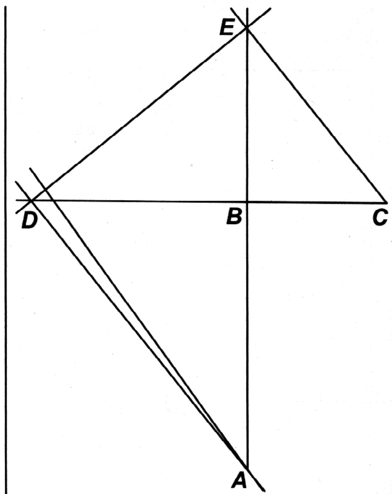


To with straightedge and compass double a cube, to draw with these instruments the edge of a cube double in volume of a cube with a given edge, is one of the ancient problems determined insoluble.

In the diagram above, if right angle ***ABC*** has ***AB*** twice as long as ***BC***, and with these two lines extended and right-angled ***ADEC*** placed as shown, it is known that if ***BC*** is the edge of a cube then ***BE*** is the edge of a cube double the volume.

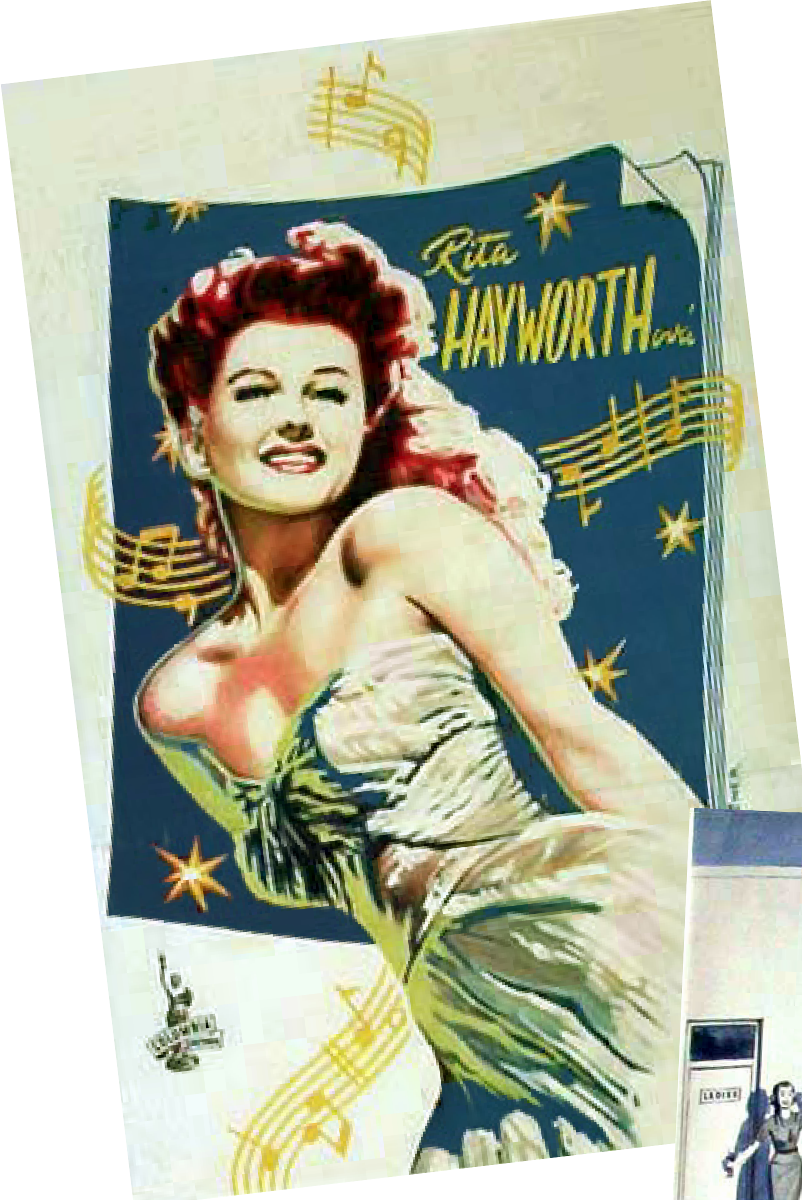
But the problem is the construction. One has to make sure shape ***ADEC*** not only meets points ***A*** and ***C***, but also that its right-angle vertices lie on perpendiculars ***AE*** and ***CD***.

For this the ancients fashioned a laborious mechanical device, with a part like a carpenter’s square for such as angle ***ADE***, and a moving crossbar for a ***CE***. The whole was then manipulated until all the above placements were reached. These accordingly involved the indirect “sliding” described previously here.

Offered presently is again a greatly simplified use of sliding, with only straightedge and compass, and a single placement to be reached:

With *AB* and *BC* extended as before, turn a line *AD* on *A* until on drawing at meeting point *D* a perpendicular *DE*, and at *E* a perpendicular *EC*, *EC* meets *C*. Only the last result is the aim.

Much more work by the author, Paul Vjecsner, is in his book and on his website, http://vjecsner.net. His advertisements were in *Scientific American* of November and December 2005, and March 2006.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