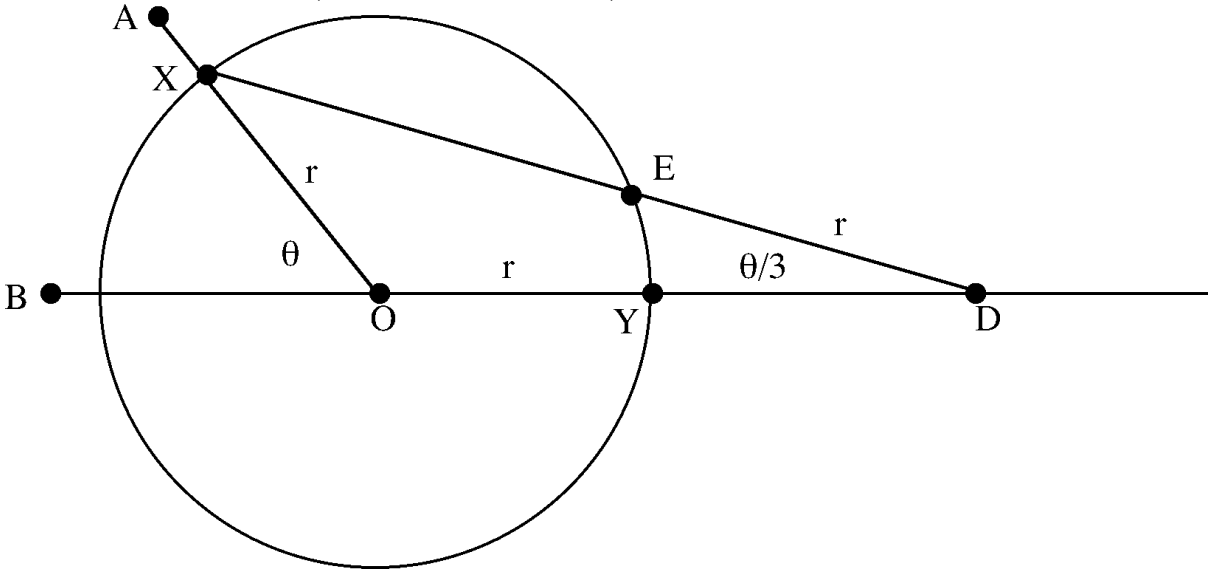
Mathematics-Science 380 – History of Mathematics
TRENT UNIVERSITY 2004-2005

Assignment #5
Due on Monday, 29 November, 2004.

1. Show that the following construction for trisecting an angle using a compass and a ruler with two marks (a distance of r apart) works.



Given that $\angle AOB = \theta$, draw a circle with centre O and radius r. Suppose this circle intersects OA at X and the line extending BO past O at Y. Slide the ruler around until its edge runs through X, one mark is on the line extending OY past Y, and the other mark lies on the circle. Let D be the point on the line where the first mark is and E be the point on the circle where the second mark is. Then $\angle EDY = \theta/3$. *[10]*

2. Describe some of the tools besides a compass and an unmarked straightedge that Greek and Hellenistic geometers experimented with. What constructions did these make possible that cannot be accomplished with a compass and straightedge alone? *[10]*

The Corporal Who Killed Archimedes

With one bold stroke
he killed the circle, tangent
and point of intersection in infinity.
    On penalty
of quartering
he banned numbers
from three up.
    Now in Syracuse
he heads a school of philosophers,
Squats on his halberd
for another thousand years
and writes:
one, two
one, two
one, two
one, two.

Miroslav Holub