a. Aristotle himself modifies Eudoxus's system for the planets slightly, seemingly to make it more physically tractable
b. While not altering his homocentric sphere models for the sun and moon

4. In his *On the Heavens* Aristotle provides philosophical and quasi-empirical arguments to support key features of Eudoxus's system
   a. The natural motion of the four elements is toward the center of the earth, while the natural motion of the celestial ether is circular
   b. All motions in the heavens have to be (eternal) uniform circular motions insofar as any speeding up and slowing down would require an external cause
   c. The earth is a sphere at the exact center, because of the natural motions toward its center
   d. The earth does not move, so that the apparent diurnal motion of the stars has to arise from motion of the sphere of the fixed stars
   e. The earth is small compared to the stars
5. These doctrines of Aristotle remained influential over the next fourteen centuries, leading to a number of conflicts with Ptolemaic astronomy
   a. Ptolemy did not have the earth at the exact center of the motions of either the sun or any of the planets, but instead at different distances from the center of their motion along the zodiac
   b. In the case of the moon and the planets, Ptolemy openly violated the requirement of uniform circular motion, replacing it with equiangular motion about a point off-center

E. Classical Greek Solutions After Aristotle
1. The two centuries after Aristotle died (322 B.C.) produced four great figures in classical Greek mathematics who continued to have a dominant influence over the next millennium and a half
   a. Euclid, who thrived in Alexandria around 320-280 B.C.: *Elements*, writings on optics
   b. Archimedes of Syracuse: (287-212 B.C.) writings on science that Galileo took as his model
   c. Apollonius of Perga (ca. 262-190 B.C.): *Conics*, but also writings in astronomy no longer extant
   d. Hipparchus of Nicea (ca. 190-120 B.C.): a fully developed, but inadequate epicyclic system that was the starting point for Ptolemy 300 years later; writings no longer extant, so that what we know of his work is from the *Almagest*
2. Greeks early looked for ways to account for anomalies in the motion of the moon and sun -- i.e. deviations from mean motion, for that reason called ***inequalities***
   a. From proof by Apollonius, recognized epicycle and eccenter as equivalent alternatives, allowing sun and moon to be either merely appearing to be moving at different angular speeds at different times or to be engaged in a compound of two uniform circular motions
   b. Willingness to use the two physically distinct but mathematically equivalent devices inter-changeably a sign that their primary interest was calculational -- i.e. calculate locations and timing of salient events among the stars