Greek Cosmology—31 Aug

- Finish 51 Peg
- What did Greek cosmologists study?
- Eratosthenes measures the Earth
- Hipparchus measures the distance of the moon

Orbit of 51 Peg

- How big is the orbit?
- Speed is 60m/s. Period is 4 day 5 hr = 101 hr.
- Circumference is 60m/s*(3600 s/hr)*101 hr = 22,000 km
- Circumference of Earth is 40,000 km
- Sun is 100 times bigger.
- Planet causes 51 Peg to move 1/200th of its radius.

What did Greek cosmologists study (200 BC-200 AD)

- Cosmology is the study of the universe at the largest scales

Eratosthenes ~200 BC

- A correspondent in Syene reports that at noon on the summer solstice, the sun illuminates the bottom of a well. In Alexandria (where Eratosthenes lived), a stick makes a 7° shadow.
- It takes a camel 50 days to travel from Syene to Alexandria. A camel can travel 100 stadia/day.
- “A clear picture is 90% of clear thinking.”
- Draw a picture to show the relationship between the sun, the well, the stick, and the two locations.
- What is the distance between Alexandria & Syene in km?
Hipparchus measures the moon’s distance ~ 200 BC

- At the Hellespont, the solar eclipse of 189 BC was total.
- In Alexandria, the moon covered ¼ of the sun.
- “A clear picture is 90% of clear thinking.”
- Draw a picture to show the relationship between the sun, the moon, the two locations, and the difference between a total & ¼ eclipse. (The diameter of the sun is ½ degree.)

Summarizing questions

- What two quantities did Eratosthenes need to measure the size of the Earth?
- If the shadow were longer, would the Earth be bigger or smaller?
- What is the key drawing for Hipparchus’s method of measuring distances?