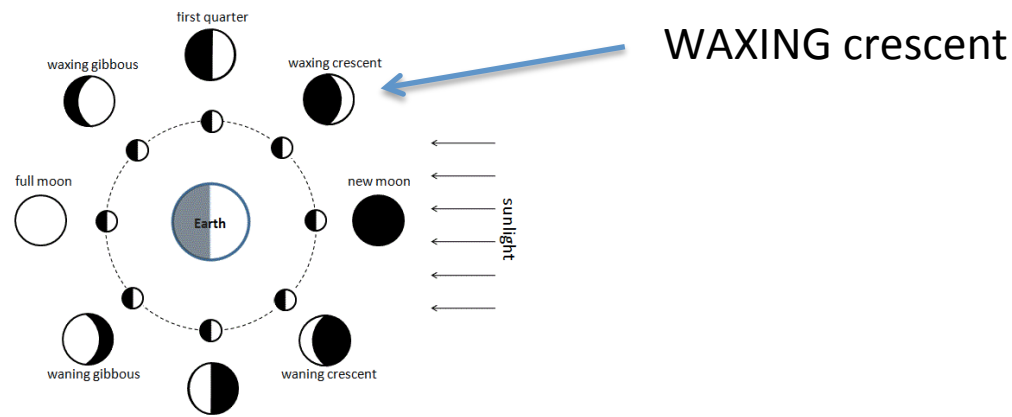


Homework 1: Phase of the Moon

Due: October 10, 2022

1. The phase of the Moon on September 30, 2022 is Waxing Crescent (23.3%). The moon will pass through the meridian at around 3 pm (or so).



2. I observed the moon on the August 15 and 16, 2022.
Phase of the Moon on August 15, 2022: waning gibbous (85%)
Phase of the Moon on August 16, 2022: waning gibbous (76%) in San Pedro, CA.

I observed the moon on August 15 at 5:55 am and on August 16, 2022 I again observed the moon at 5:55 am.



In both pictures, I aligned myself so that the indicated tree was due south (180 degrees). The moon was in the tree in the left hand picture and to the east of the tree in the right hand picture.

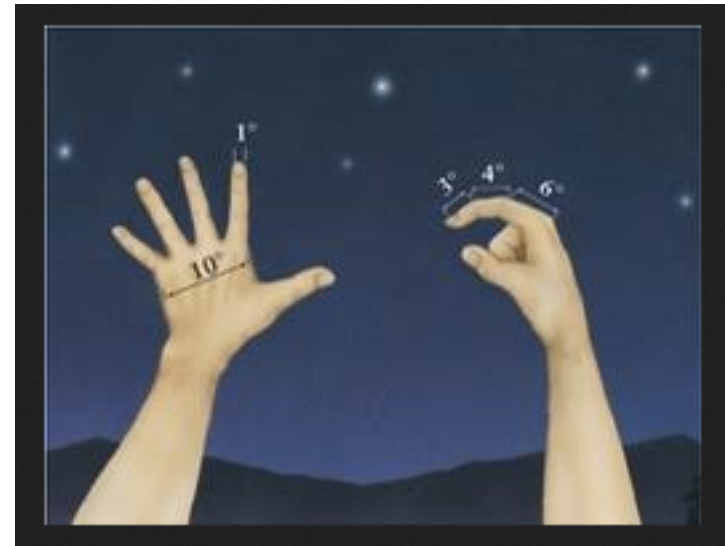


I estimated the position of the moon
on both nights



I estimated angles using my
fist held at arm's length (as 10
degrees), as soon below.

Other angles could be
estimated using fingers and
thumbs.



8/15/2022: $\sim 20^\circ$ west of south and
 $\sim 60^\circ$ above the horizon

8/16/2022: $\sim 10^\circ$ west of south and
 $\sim 60^\circ$ above the horizon

Over the course of a day, the moon moves east-to-west across the sky, that is, the moon would move left-to-right across the images below over the course of a day. Since I looked at the moon at the same time on the two days, it appears as though the moon has not moved as far to the west in the second picture, that is, it rose later. I guessed it was about 10° degrees behind or about 40 minutes (actually it is about 50 minutes per day).



Based on my numbers, it loses 40 minutes a day and so would take about 36 days to complete one cycle. It actually takes around 29.5 days. If I had measured the shift per day as 12° rather than 10° , I would gotten closer to the correct answer.

