Astronomy 110

HOMEWORK #7

Use a calculator whenever necessary.

_For full credit, always show your work and explain how you got your answer. Be careful about units!_

Please CIRCLE or put a box around your final answer if it is numerical.

If you wish, you may discuss the questions with friends, but please turn in your own hand-written solutions, with questions answered in your own way.

1) Precession

   a) What will the next first sign of the zodiac be?

   b) What will the first sign of the zodiac be in 10,000 years?

   c) Where will the summer solstice be located in 10,000 years?

   d) Where will the NCP be located in 6,000 years? (Hint: use your circumpolar sky chart)

2) The moon’s diurnal and monthly motion

   If a star is in transit at the same time as the moon is in transit today…

   a) Where will the moon be 3 hours later relative to the celestial meridian?

   b) Where will the moon be 24 hours later relative to the star?

   c) Where will the moon be 1 week later relative to the star?

   c) If the moon is observed rising tonight at 6 p.m., when will it rise 2 days later?

   d) If the moon is observed rising tonight at 6 p.m., when will it rise 7 days later?
3) Lunar Phases

a) If you see the moon rising at 9 p.m., what phase must the moon be?

b) If you observe a 1st quarter moon rising, what time must it be?

c) If the time of day is 12 a.m. (midnight) and the moon is at last quarter, where must you look to see it?

d) What is the moon’s phase (as seen from earth) in the following diagram:

![Diagram of the moon's orbit]

e) What is the moon’s phase (as seen from earth) in the following diagram:

![Diagram of the moon's orbit]

f) At 11 p.m. what phase of the moon would be in transit?

g) At what times of day is it possible to see a waning gibbous moon above the horizon?
4) If you lived on the moon, how would the apparent position of the Earth change in your sky over time with respect to the stars? With respect to your celestial meridian?

5) If you lived on the moon, near its equator, and you observed the sun in transit, how long would it be until the sun went through transit again?