**Planisphere Part 1**

1. The constellations are sometimes associated with seasons.  For example, Orion is often referred to as a winter constellation.  A Constellation is associated with the season during which the constellation is high in the sky in the evening, say around midnight local time.  
     
   Which of the constellations below are winter constellations? The first day of Winter is around 21 December.
   * Orion, Auriga, and Gemini.
2. The constellations are sometimes associated with seasons.  For example, Orion is often referred to as a winter constellation.  A Constellation is associated with the season during which the constellation is high in the sky in the evening, say around midnight local time.   
     
   Which of the constellations below are summer constellations? The first day of Summer is around 21 June.
   * Hercules, The Head of Draco, and Lyra.
3. Circumpolar constellations are always above the horizon.  According to the planisphere, which of the constellations below are circumpolar?
   * Cassiopeia, Draco, and the Big Dipper
4. For an observer near Grand Rapids, what is the altitude of the bright star Sirius, the brightest star in Canis Major, on 1 January at midnight local solar time (LST)?
   * 25.
5. For the previous question, what time would it be on a real clock set to the proper civil time?  Enter the time as a four-digit numeral -- not including the colon -- in 24-hour format.  For example, 10:15 pm would be entered as 2215.
   * 0045.
6. For an observer near Grand Rapids, what is the azimuth of the tiny constellation Delphinus at midnight EDT on 15 September?  Enter your answer as a number (in numerals) and do not include 'degrees'.
   * 210.
7. For an observer near Grand Rapids, what is the altitude of the tiny constellation Delphinus at midnight EDT on 15 September?  Enter your answer as a number (in numerals) and do not include 'degrees'.
   * 60.
8. According to the planisphere, what is the maximum altitude the bright star Betelgeuse in the constellation Orion reaches for an observer in Michigan?
   * 60.

**Planisphere Part 2**

1. At 11:00 pm civil time (the time shown on our clocks: EST or EDT, whichever is appropriate), on 20 Sept., I look from the beach in Grand Haven in the following direction: azimuth = 260 & altitude = 60.  What constellation am I looking at?
   * Lyra.
2. Set your planisphere to show the sky at 11 pm EST on 20 January here in the Grand Rapids area.  Locate the Big Dipper  What is the approximate azimuth of the "pointer stars" in the Big Dipper?
   * 40.
3. Set your planisphere to show the sky at 11 pm EST on 20 January here in the Grand Rapids area (same setup as for the last question).  Locate the Big Dipper.  What is the altitude of the "pointer stars" in the Big Dipper?
   * 45.
4. On 6 February, what time does the constellation Orion crosses the meridian? Give your answer in local solar time (planisphere time).  
     
   Enter the time as a four digit numeral in 24-hour format (hhmm), not including the colon and rounded to the nearest 15 minutes. For example, 8:15 pm would be entered as 2015; 8:15 am would be 0815.
   * 2030.
5. On 6 February, what time does the constellation Orion cross the meridian? Answer in civil time (standard or daylight time, which ever is appropriate for the date in question), for an observer in Grand Rapids.  
     
   Enter the time as a four digit numeral in 24-hour format (hhmm), not including the colon and rounded to the nearest 15 minutes. For example, 8:15 am would be entered as 2015; 8:15 am would be 0815.
   * 2115.
6. With your answer to the previous questions as a starting point, fill in the blanks:  Observed from anywhere, Orion crosses the meridian **[num]** (an integer) hours **[when]** (enter one word: earlier or later) each month compared to the month before.
   * 2; Earlier.