

Do the following problems and be prepared to discuss them in class.

1. At what local solar time does Orion (RA = 05h 30m; Dec = 00°) rise on Dec. 14?
2. On what date does the vernal equinox set at 2:30 am?
3. If you observe a star to have a maximum altitude of 84° above the *southern* horizon and a minimum altitude that is 6° above the *northern* horizon,
 - a) what is your latitude?
 - b) what is the star's declination?
4. If the local time is 08:10 am and you are at a longitude of 118°W , and simultaneously the local time on a certain island is 08:46 am,
 - a) what is the longitude of the island?
 - b) is the island east or west of your position?
5. Suppose you are observing from the Cerro Tololo Interamerican Observatory in Chile (CTIO; latitude = 30°S , longitude = 71°W) on May 28. At 09:50 pm Eastern Time you observe a bright star crossing the meridian 59° above the southern horizon.
 - a) What is the star's declination?
 - b) What is the GMT?
 - c) What is your local solar time?
 - d) What is the RA of the Sun?
 - e) What is the local sidereal time?
 - f) What is the star's RA?
 - g) What star is it?
6. Suppose you are sailing in the Pacific on July 07 and observe Vega (RA = 18h 35m; Dec = $+39^\circ$) at the zenith. Your GMT clock reads 08:55 am.
 - a) What is Vega's HA?
 - b) What is the local sidereal time?
 - c) What is the RA of the Sun?
 - d) What is the HA of the Sun?
 - e) What is the local solar time?
 - f) What is your longitude?
 - g) What is your latitude?
 - h) Look at a map and describe where you are.