

Homework 1

Please write all your work and answers on separate paper. (You can turn in this page with the questions or not, as you wish). Show all your work on calculations and explain your reasoning whenever you can.

1. It is said that the three most important things in Real Estate are Location, Location, and Location. Determine the location of one of the following places, as follows:
 - a. Roll the die or dice and record the result, a random number from 1 to 12.
 - b. Select the corresponding location from this list:
 - 1) $40^{\circ}46' 04''$ N, $73^{\circ}58' 18''$ W
 - 2) $28^{\circ}25' 07''$ N, $81^{\circ}34' 52''$ W
 - 3) $36^{\circ}05' 44''$ N, $115^{\circ}10' 34''$ W
 - 4) $47^{\circ}37' 14''$ N, $122^{\circ}20' 59''$ W
 - 5) $48^{\circ}52' 26''$ N, $2^{\circ}17' 42''$ E
 - 6) $39^{\circ}54' 12''$ N, $116^{\circ}23' 30''$ E
 - 7) $21^{\circ}21' 54''$ N, $157^{\circ}57' 00''$ W
 - 8) $64^{\circ}08' 34''$ N, $21^{\circ}57' 01''$ W
 - 9) $55^{\circ}56' 55''$ N, $3^{\circ}12' 03''$ W
 - 10) $33^{\circ}51' 25''$ S, $151^{\circ}12' 55''$ E
 - 11) $45^{\circ}26' 02''$ N, $12^{\circ}20' 17''$ E
 - 12) $35^{\circ}21' 29''$ N, $138^{\circ}43' 52''$ E
 - c. Convert the coordinates to decimal degrees (write it down!) Hint: remember that West longitude is negative.
 - d. Use Google Earth or Google Maps (maps.google.com) to visit the location and describe what is there.
2. Days, seconds, and years:
 - a. How many seconds are there in one Mean Solar Day (24 hours)?
 - b. How many seconds are there in one Siderial Day (which is 23 hours, 56 minute, 4 seconds)?
 - c. How much difference between the two accumulates over 365 days?
3. Right Ascension is measured around the sky with 24 hours for a full circle. How many degrees are there in 1 hour of RA?
4. The star Thuban (α Draconis) in the constellation Draco was once the pole star (around 5000 years ago). The celestial coordinates of Thuban are $14^{\text{h}}04^{\text{m}}23.35^{\text{s}}$, $+64^{\circ}22'33''$. How many decimal degrees is Thuban from the celestial north pole today?
5. The star Sirius has celestial coordinates $06^{\text{h}}45^{\text{m}}09^{\text{s}}$, $-16^{\circ}42'58''$. How far is Sirius from the celestial meridian, measured in degrees, minutes of arc, and seconds of arc?
6. Briefly describe what causes the phases of the moon.