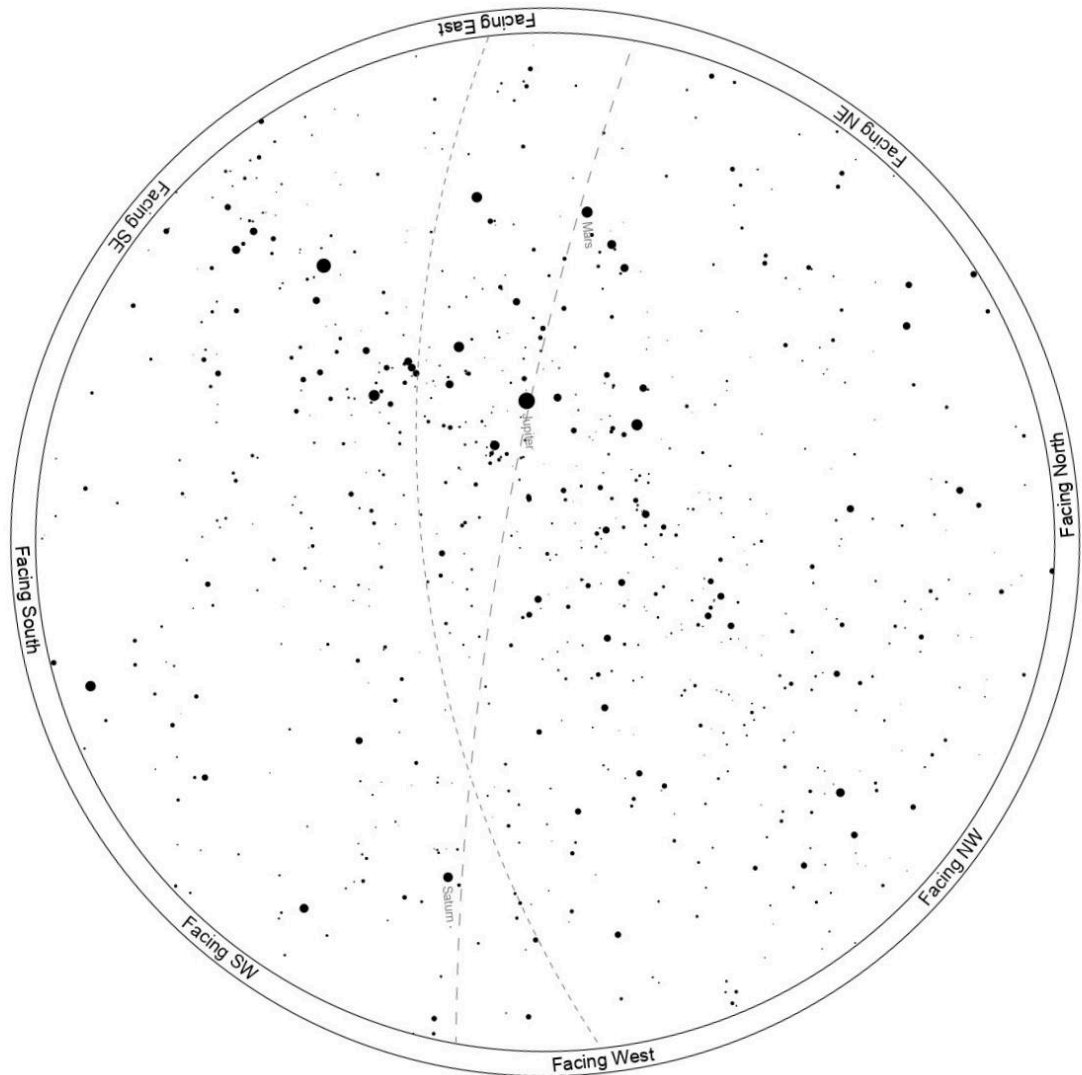


OC1

1. **Answer: 27°7' N**

[Answer between 27-28° gains all 2.5 points, with each degree of inaccuracy 0.5 points are lost. e.g. if a student answer 26° or 29°, they would receive 2 points]

2. Answer:

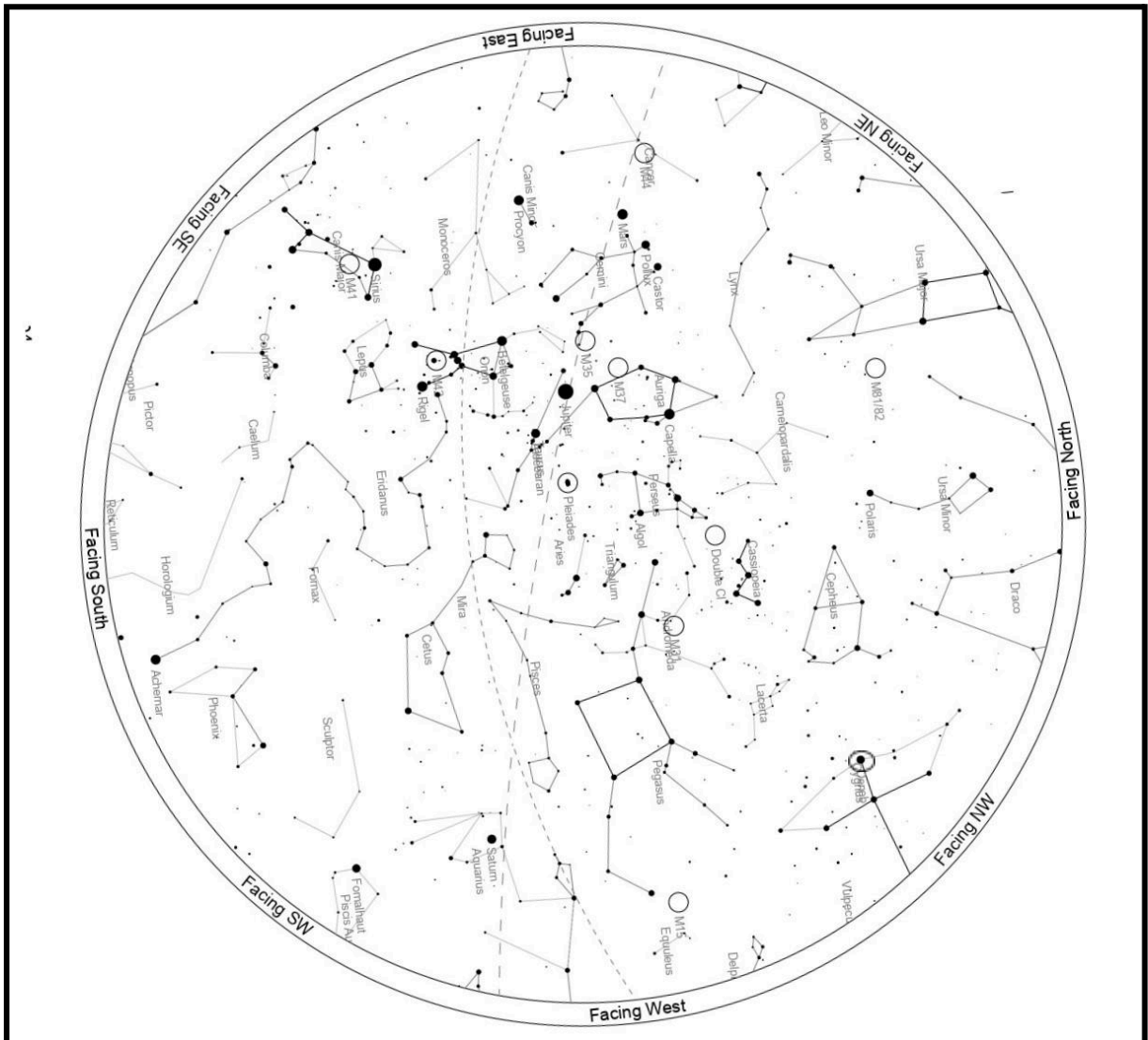


[With 10° of inaccuracy, 0.5 points is lost for cardinal points, the planets have to be circled correctly to gain full points, correctly circling the planets but not labeling it, would only earn 0.5 points]

3. Same map as above except for the local meridian to go straightly from North to South.

[10 degree of inaccuracy will lead to a 0.5 points loss]

4. Can be any constellations shown in the sky map below.
 [If the tracing composes of at least the brightest stars then the student will earn full points, missing one or more prominent star will lead to a loss of 0.5 point]

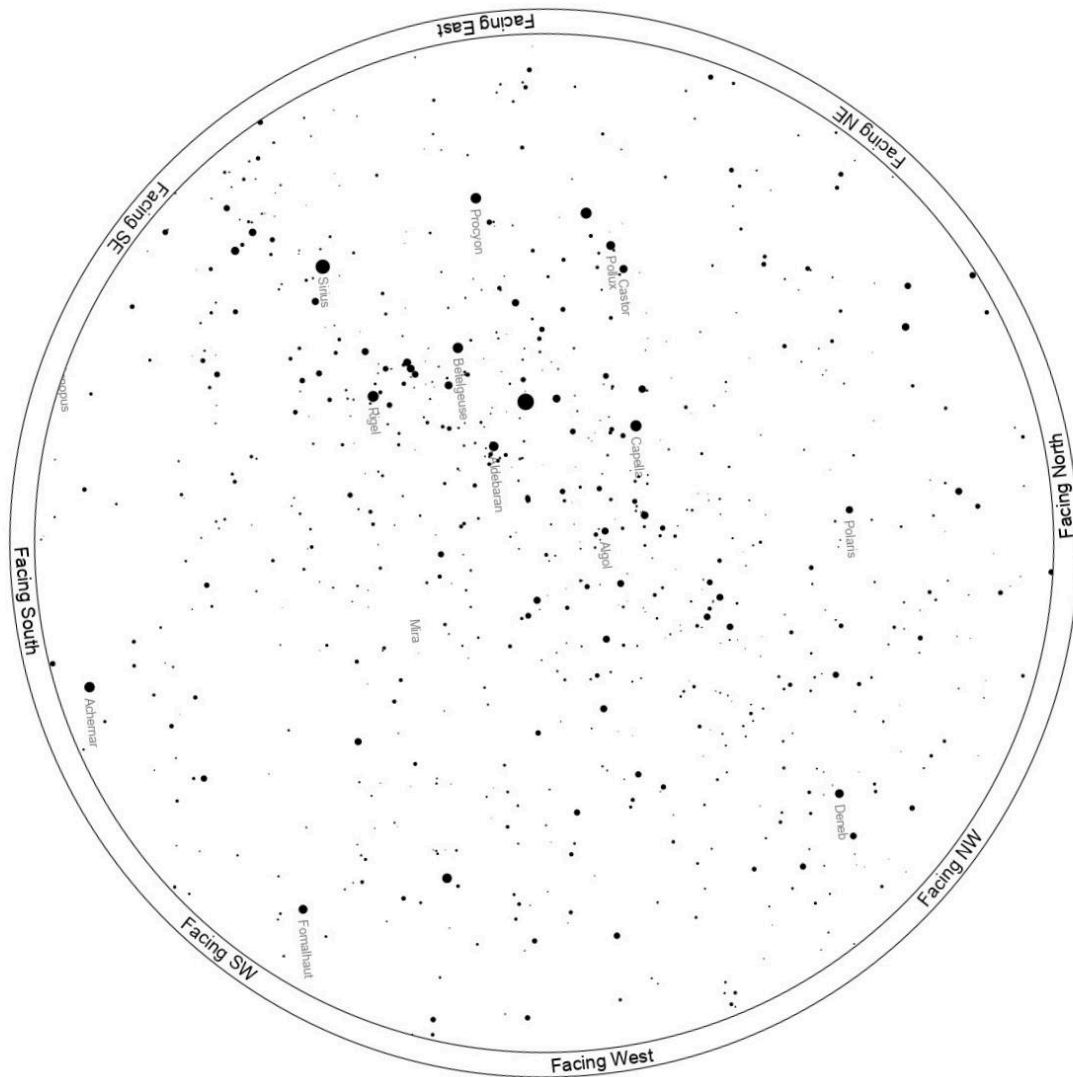


5. Answer:

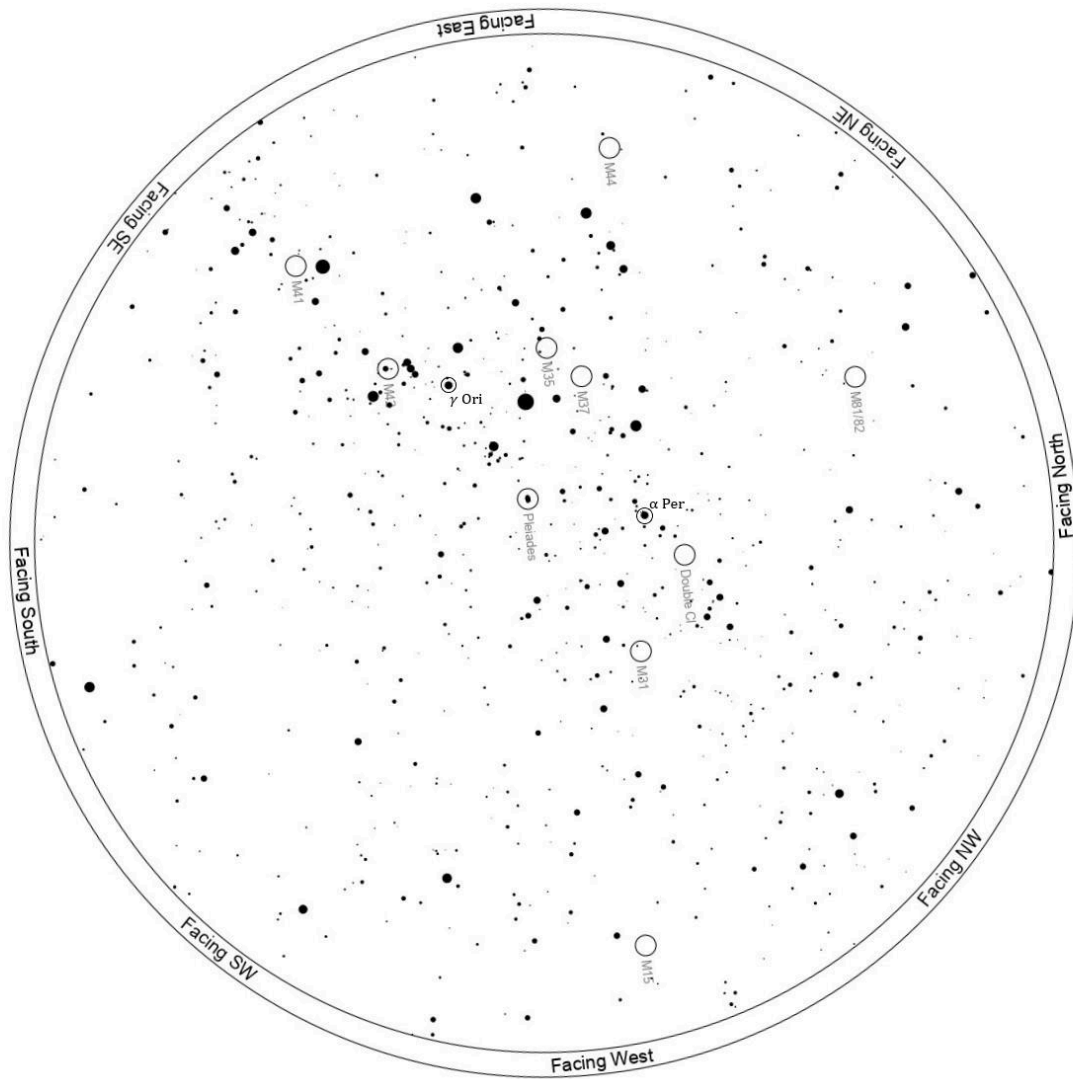
- A. Alpha Canis Majoris (Sirius)
- B. Alpha Aurigae (Capella)
- C. Beta Orionis (Rigel)
- D. Alpha Canis Minoris (Procyon)

[0.5 points for each star can be earned by writing the right Bayer designated name or abbreviation of the star, 0.5 points for each star can be earned if the star is in the right order in the list, 0.5 points for each star can be earned if the star is marked correctly in the sky map]

Note: Sky map is attached below



6. Answer: Sky map is attached. Look for M42, M81, M41, M31, γ Orionis (Ori) and α Persei (Per).
[If the object labeled is within the size of the circles below, then the student earns full credit. If the object is in the constellation its supposed to be but not in the right place, the student earns 0.5 points]



7. Answer: Equatorial coordinates of the star Aldebaran (α Tauri)

Right Ascension: 4h 36m

Declination: 16° 31'

[If the RA and Dec is between

3.5h to 5.5h and 15.5° to 17.5°, the student earns full credit (2.5 points).

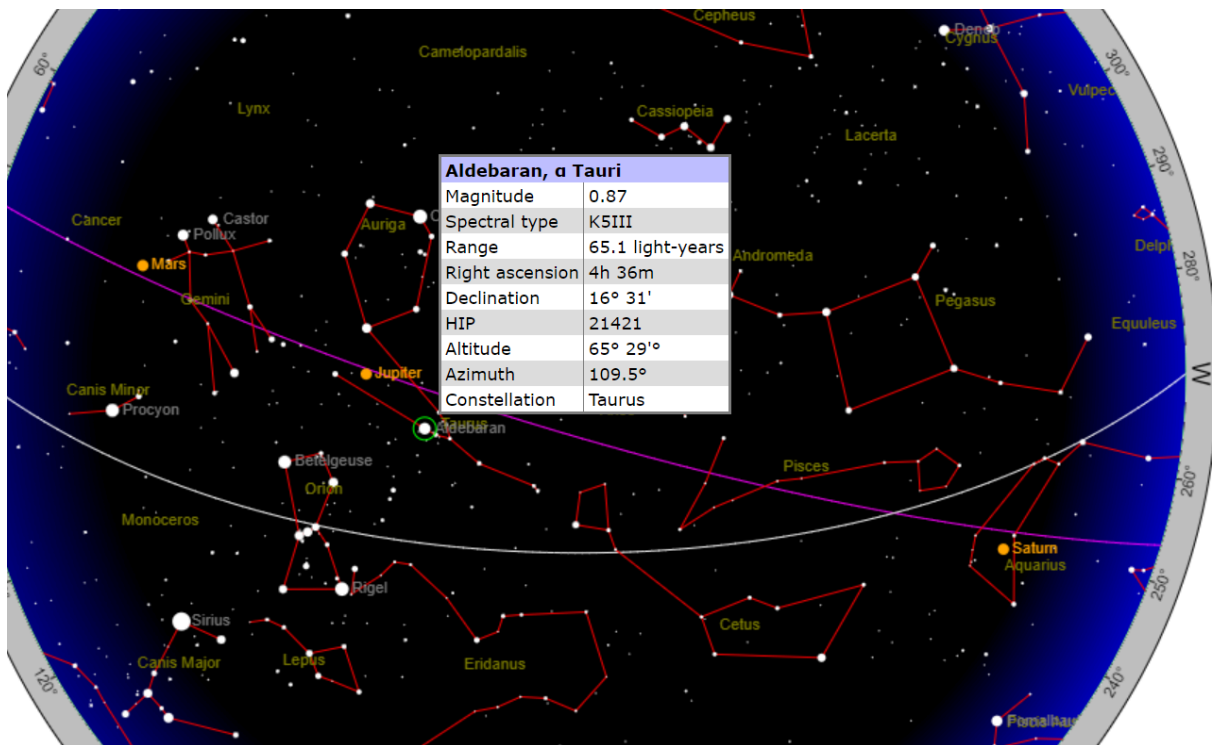
2.5h to 6.5h and 14.5° to 18.5° = 2 points,

1.5h to 7.5h and 13.5° to 19.5° = 1.5 points,

0.5h to 8.5h and 12.5° to 20.5° = 1.0 points,

-0.5h to 9.5h and 11.5° to 21.5° = 0.5 points,




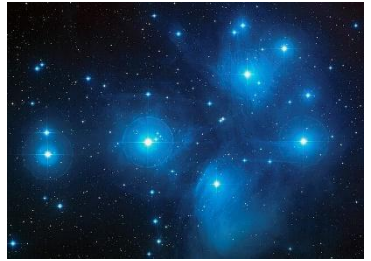
Anything beyond this range will not earn any credit.]

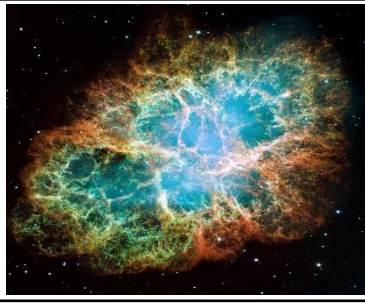


OC2(1.5x6)

Asteroids	Dwarf Planets	Satellites
6	1,2	3,4,5

OC3(1.5x12)

	M 97	Ursa Major
	M101	Ursa Major
	M51	Canes Venatici
	M45	Taurus



M1

Taurus



M42

Orion