Use your star wheel to work out the following problems. If it's clear out, check your answers (when relevant) by looking up! Remember: times on the Star Wheel are in PST. For problems involving time, take care to convert correctly between PDT and PST.

1. Where in the sky should you look to find the following at 8:00 pm PDT = 7pm PST on September 1?
State the estimated altitude in degrees, the cardinal direction (e.g., SW or ENE), and an estimated azimuth in degrees (0° to 359°). Remember that altitude is 0° at the horizon and 90° at the zenith. When making these estimates, remember to make use of the mark you made on your Star Wheel that represents the zenith.

<table>
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<th>Altitude</th>
<th>Cardinal Direction</th>
<th>Azimuth</th>
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the constellation Sagittarius:

the constellation Cygnus:

the star Antares in Scorpius:

the star Polaris in Ursa Minor:

M13, a globular star cluster in Hercules:

M31, the Andromeda galaxy:

2. Estimate the R.A. and Dec. of the following:

the star Arcturus in Boötes:

the star Vega in Lyra:

the double cluster in Perseus:

M22, a globular cluster in Sagittarius:

the Pleiades star cluster in Taurus:

3. If you see the brightest star in Aries due south on Sept. 1, what time is it (PST and PDT)?

4. If you see M31, the Andromeda galaxy, near the zenith at midnight (PDT), what date is it?

5. The center of the Milky Way galaxy is in the direction R.A. = 17h 46m Dec. = −29°.

On the other side of this sheet, make a sketch of the bright stars that make up one or two constellations close to this position, then carefully place the Galactic center on your sketch.