

# Orbit Construction Checklist

## Read the LAB!

Sun Centered - circular orbit centered on the Sun

- 1 Determine semi-major axis
- 2 Draw circular orbit with center on Sun
- 3 Mark Perihelion, aphelion and draw perihelion/aphelion line
- 4 Indicate longitude of ascending node, descending node and draw line of nodes

Displaced - circular orbit but not centered on the Sun

- 1 Find perihelion direction and draw line of perihelion through the Sun.
- 2 Determine "offset" of center of circular orbit,  $a \cdot e$
- 3 Set center of orbit at offset in direction opposite of perihelion/Sun to insure that perihelion is closest point of orbit to Sun.
- 4 Determine semi-major axis.
- 5 Draw circular orbit with center at offset,  $a \cdot e$  from Sun.
- 6 Indicate aphelion
- 7 Indicate longitude of ascending node, descending node and draw line of nodes

Ellipse - construct elliptical orbit with appropriately sized loop and appropriately spaced tacks.

- 1 Determine loop size,  $a \cdot (1 + e)$ .
  - draw loop size
  - set tacks at loop distance and tie loop
- 2 Draw line of perihelion through the Sun to place major axis
- 3 Determine tack spacing,  $2a \cdot e$ , required to draw loop.
- 4 Place tack in Sun and other tack opposite perihelion on the perihelion line
- 5 Draw the orbit
- 6 Indicate aphelion
- 7 Indicate longitude of ascending node, descending node and draw line of nodes