1. In class we reviewed Example 1.18 from the text: A bead moves with constant speed u along the spoke of a wheel, starting from the center of the wheel at $t = 0$. The angular position of the spoke is given by $\theta = \omega t$, where ω is a constant.

   We determined that the velocity of the bead (in polar coordinates) is given by:

   $$\vec{v} = u\,\hat{r} + u\omega t\,\hat{\theta}$$

   and the acceleration is given by

   $$\vec{a} = -u\omega^2 t\,\hat{r} + 2u\omega\,\hat{\theta}$$

   Below is a sketch of the trajectory of the bead, for $u = 1$ m/s and $\omega = \pi$ rad/s. At the points marked by ●'s, calculate the x and y components of the bead's velocity and acceleration. Use these to draw arrows representing $\vec{v}$ and $\vec{a}$ on the figure.