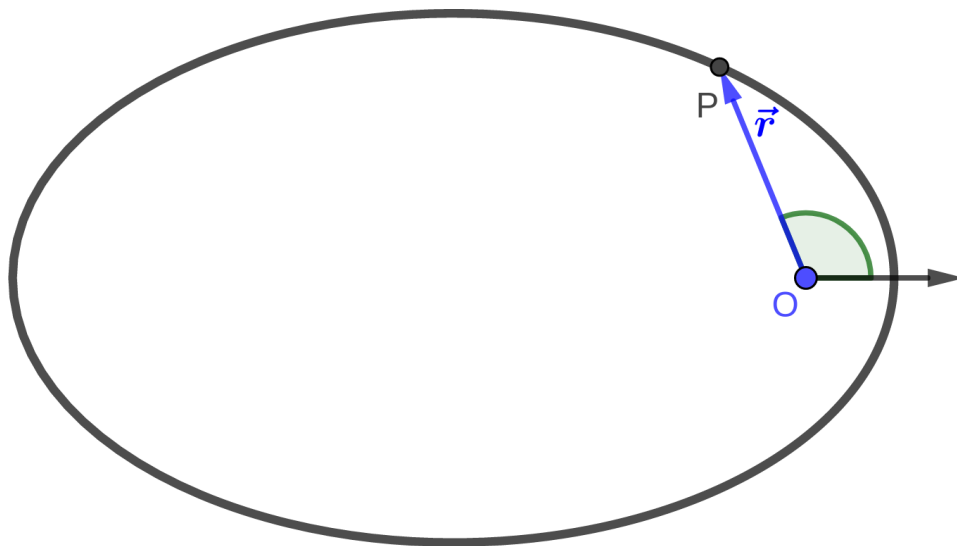


1. On the figure below, draw  $\hat{s}$  and  $\hat{\phi}$  at  $P$ .



2. Find  $\frac{d}{dt}\hat{s}$  and  $\frac{d}{dt}\hat{\phi}$  in terms of  $\hat{s}$  and  $\hat{\phi}$ .
3. Find  $\vec{v}$  in terms of  $\hat{s}$  and  $\hat{\phi}$ .