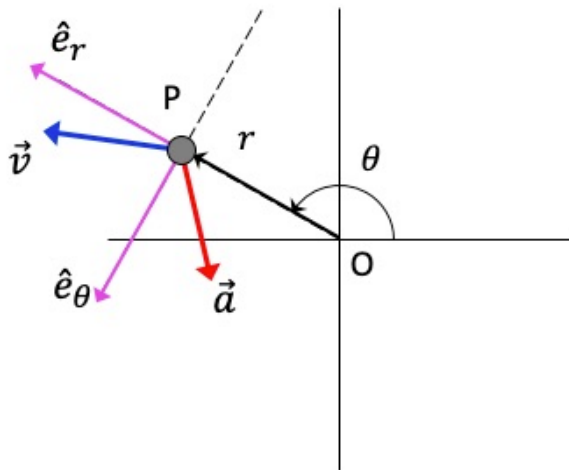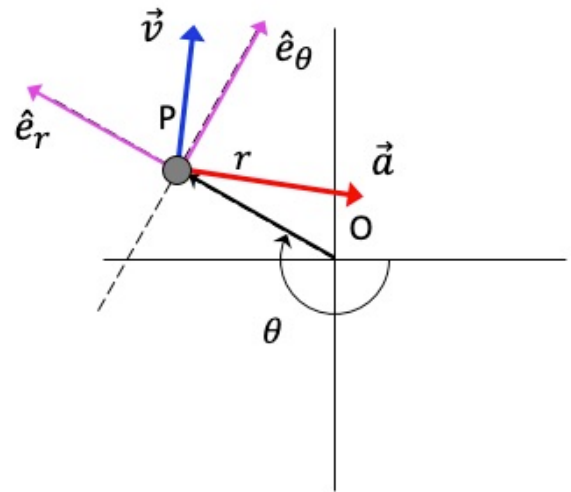Given positions of point P shown below in terms of radial position r and position angle θ. For each of the four situations below, sketch the polar unit vectors $\hat{e}_r$ and $\hat{e}_\theta$, along with the velocity and acceleration vectors, $\vec{v}$ and $\vec{a}$.

Recall: $\vec{v} = \dot{r}\hat{e}_r + r\dot{\theta}\hat{e}_\theta$ and $\vec{a} = (\ddot{r} - r\dot{\theta}^2)\hat{e}_r + (r\ddot{\theta} + 2\dot{r}\dot{\theta})\hat{e}_\theta$.
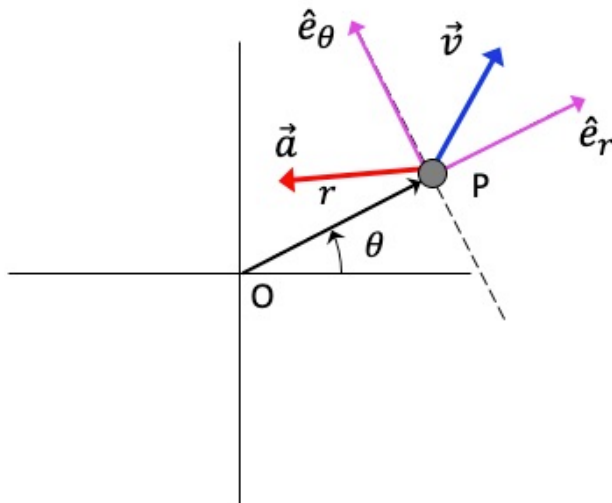
a) $\dot{r} > 0$ = constant, and $\dot{\theta} > 0$ = constant

b) $\dot{r} > 0$ = constant, and $\dot{\theta} > 0$ = constant

c) $\dot{r} > 0$ = constant, and $\dot{\theta} > 0$ = constant

d) $\dot{r} > 0$ = constant, and $\dot{\theta} > 0$ = constant