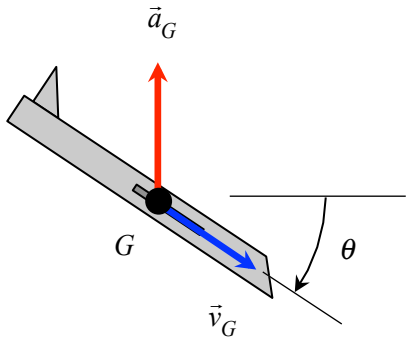
Homework H1.D

Given: At one instant in time, an aircraft is traveling along a path in a direction defined by θ below the horizontal with the center of mass G of the aircraft having a speed of $|\vec{v}_G|$. G is also known to have an acceleration that is pointing vertically upward with a magnitude of $|\vec{a}_G|$.

Find: For this given instant in time:

(a) show the path unit vectors $\hat{e}_t$ and $\hat{e}_n$, along with $\vec{v}_G$ and $\vec{a}_G$, in a sketch.

(b) determine the rate of change of speed of G and the radius of curvature of G.



Use the following parameters in your work: $\theta = 36.87°$, $|\vec{v}_G| = 900$ km/hr and $|\vec{a}_G| = 30$ m/s^2.