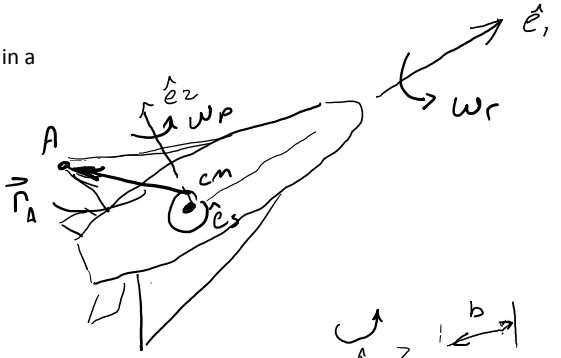
Practice 3.1, 3.5, 3.10 Homework 3.4, 3.6, 3.18

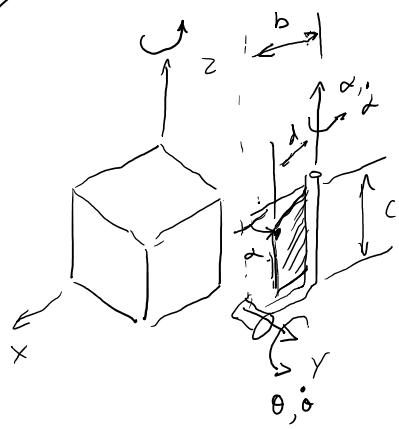
Friday, June 16, 2017 11:34 AM

3.1: Consider the aircraft shown, find the angular velocity of the wing tip when the aircraft is in a roll with rate w_*r*, pitch of rate w_*p*, and linear forward speed of v_1

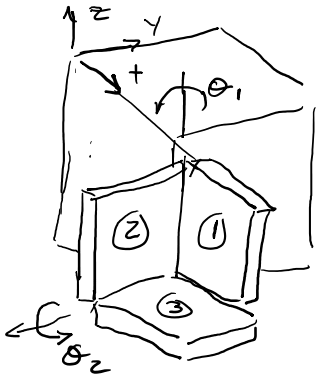


3.4 A spacecraft spins about vertical axis e3 with constant rate cap_omega. A solar panel is deployed by rotation about two nonintersecting axes separated by a distance b.

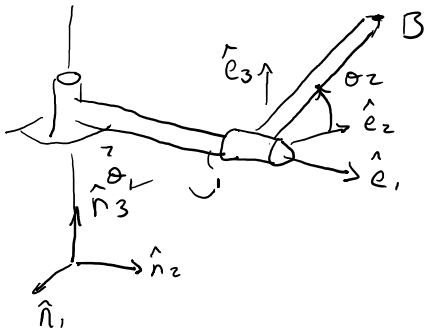
a) Find the angular acceleration of the panel for arbitrary theta
b) Find the velocity and acceleration of point P for alpha_dot, theta_dot and cap_omega constant.
c) Describe the orientation of the solar panel relative to the spacecraft as a function of alpha and theta.



3.5 A stowed solar panel on the satellite undergoes two rotations in the sequence shown. Find the orientation of the panel relative to the satellite frame.

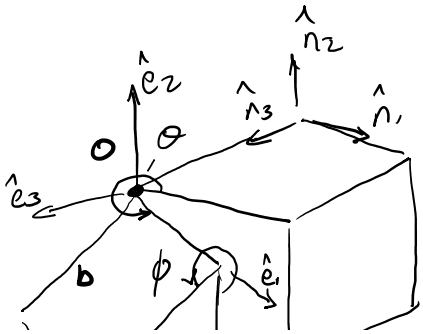


3.6 The two-link serial mechanism rotates about two axes as shown. Find the velocity and acceleration for the end point B when theta1_double_dot=theta2_double_dot = 0;

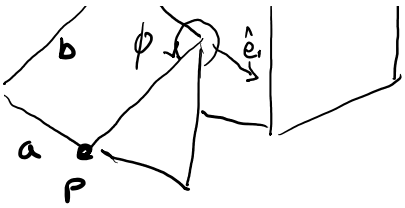


3.10: A compound solar panel on a satellite is shown. The inner panel undergoes a rotation about the vertical axis, e2, while the outer panel undergoes a rotation about the e1 axis.

a) Find the velocity and acceleration of point P on the edge assuming the angular rotation rates are constant.
b) Describe these in the a frame attached to the satellite and the a frame attached to the outer panel.



a) Find the velocity and acceleration of point P on the edge assuming the angular rotation rates are constant.
b) Describe these in the a frame attached to the satellite and the a frame attached to the outer panel.



3.18 write a matlab program that will animate a kinematic model of the box falling off the ledge with constant angular velocity .1 rad/s