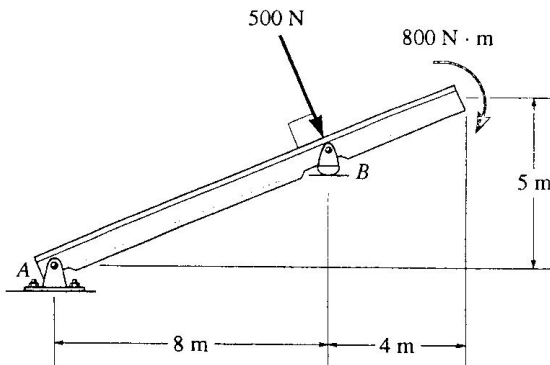
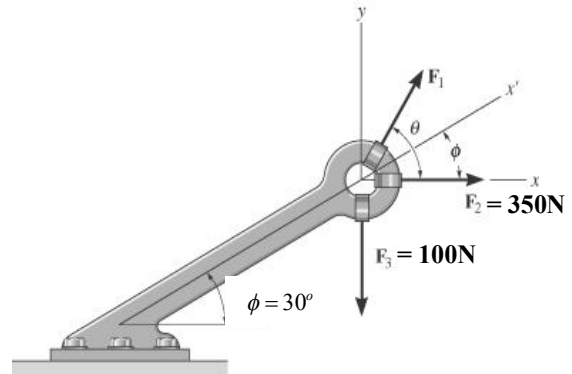
	Alexandria Higher Institute of Engineering & Technology (AIET)	
	General	
	ME001	Mechanics I
	Examiners:	Dr. Rola Afify
		Preparatory Year
		Final, Jan., 23, 2011
		Time: 3 hours

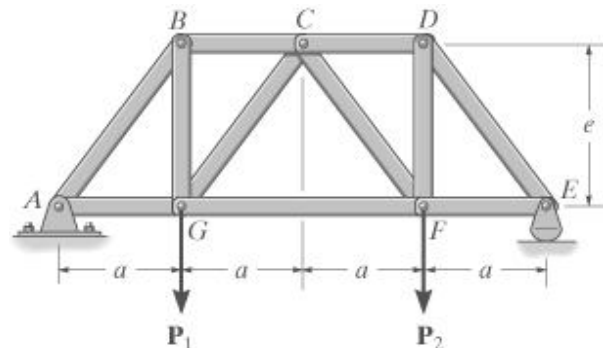
Answer the following questions:

- 1- Express each of the three forces acting on the bracket in Cartesian vector form with respect to the x and y axes. Determine the magnitude and direction Θ of F_1 so that the resultant force is directed to the positive x axis and has a magnitude of $F_R = 600$ N.

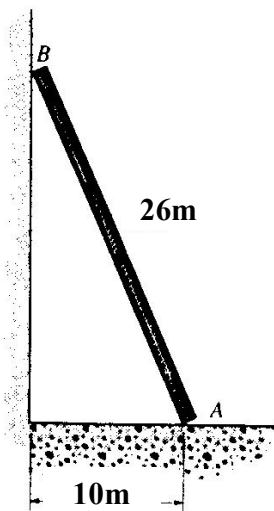
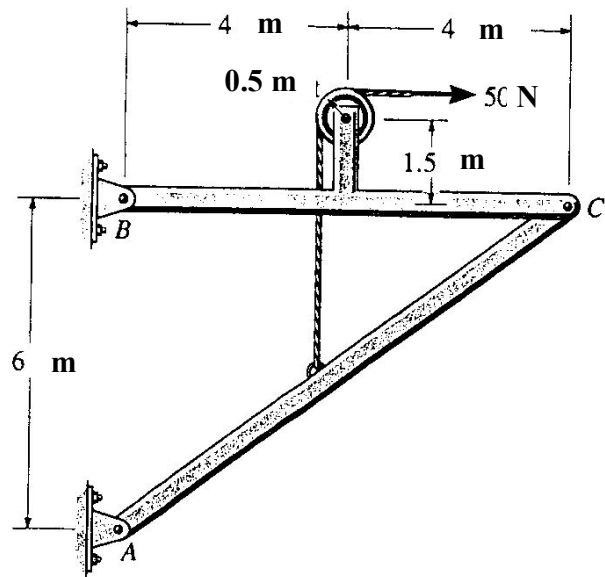


- 2- Determine the magnitude of the reactions on the beam at A and B. Neglect the thickness of the beam.

- 3- Determine the force in each member of the truss and state if the members are in tension or in compression. Set $P_1 = 40$ kN, $P_2 = 20$ kN, $a = 1.5$ m and $e = 2$ m.



- 4- In the frame shown, determine the vertical and horizontal components reactions at pins B and C.



- 5- The uniform pole has a weight of 30N and a length of 26m. If it is placed against the smooth wall and on the rough floor in the position shown in figure. Will it remain in this position when it is released? The coefficient of static friction $\mu_s = 0.3$.

- 6- a) Proof that $v = v_o + at$, if $a = \text{constant}$ and the particle starts from $v = v_o$.
 b) The velocity of a particle traveling in a straight line is given by $v = 6t - 3t^2$ m/s, where t is in seconds. If $s = 0$ at $t = 0$, determine the particle's acceleration and position when $t = 3$ s.

Good Luck