Name: _____

TAM 210/211 Written Assignment 3 (due on Friday, Feb 3$^{\text{rd}}$)

Romeo tries to reach Juliet by climbing with constant velocity up the rope which is knotted at point A, as illustrated below. Assume Romeo has a mass, m.

1. Determine the magnitude of the force in the all rope segments. Your answers should be a function of mass, m.

2. Any of the ropes will break if the force exceeds 1kN. What is the largest mass that Romeo can be and not break the rope? Explain.

3. Repeat the analysis above (#1 &#2) if we maintain the position of points A and B, but change the position vector of point C with respect to point A such that $\mathbf{r}_{AC} = 1.5\,\mathbf{i} + 0.5\,\mathbf{j}$ m. Draw conclusions.

4. Suppose Romeo's friend, Mercutio, were to come along as well and they're combined weight just barely exceeded the maximum you found in problem #2. What single alteration to the system in #2 (other than that mentioned in #3) might you suggest that would allow for both of them to climb the rope simultaneously?