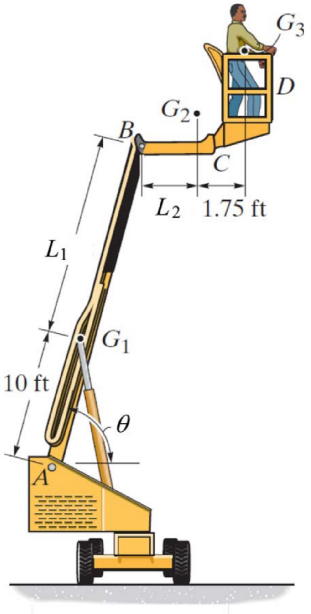
University of Victoria Engineering

ENGR 141 – Engineering Mechanics

Spring 2023
Tutorial No. 3

Version: 3

A technician worker uses a lift bucket to reach power lines. The centres of gravity of the boom *AB,* bucket, and technician be located at G_1, G_2, and G_3, respectively



a) Determine the resultant moment developed by all the forces about point *A,* if

$G_1 = 1950$ lb, $G_2 = 157$ lb, and $G_3 = 161$ lb

$L_1 = 15$ ft, $L_2 = 2.25$ ft, $\theta = 66°$

b) What is the maximum length of the extensible boom (L_1), if the lift bucket tips over when the resultant moment at *A* exceeds

$M_A = 16$ kip.ft (CW)?

Instructions: Two submissions are required.

1) *At the end of the tutorial session, you will hand out a paper copy of your solution to the Teaching Assistant. Make sure that you have a second copy of your solution, so you can complete the final draft. Do not forget to write your names and student numbers in your submission. A student who is absent from the tutorial will not receive any credit for it. A student can join the session remotely (e.g., zoom, WhatsApp, etc.), but you as a team must arrange the communication and let the Teaching Assistant know that a student is working remotely with the team.*

2) *Before the beginning of the next tutorial, this could be anytime during the week, upload a pdf file of your complete solution. Make sure you show all the steps necessary to solve this problem. Upload the pdf file under* ***Tutorial 3****. Include your names and student numbers. Only one submission per team.*