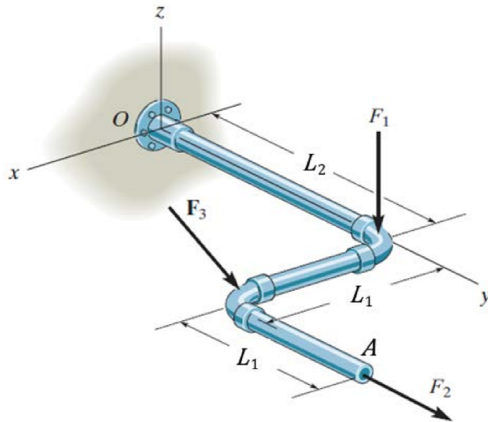


A system of three forces is acting on a pipe assembly as shown.



Assume the following forces:

$$F_1 = 550 \text{ N}, \quad F_2 = 300 \text{ N}, \text{ and}$$

$$\mathbf{F}_3 = [ -250 \mathbf{i} + 450 \mathbf{j} - 400 \mathbf{k} ] \text{ N}$$

and let the length of the pipes be

$$L_1 = 1.4 \text{ m and } L_2 = 1.9 \text{ m}$$

- Reduce the force system by an equivalent resultant force and couple moment at point O.
- Reduce the force system by an equivalent resultant force and couple moment at point A.

Note directions of  $\mathbf{F}_1$  and  $\mathbf{F}_2$  shown in figure

**Instructions: Two submissions are required.**

- 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.
- 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 4**. Include your names and student numbers. Only one submission per team.