



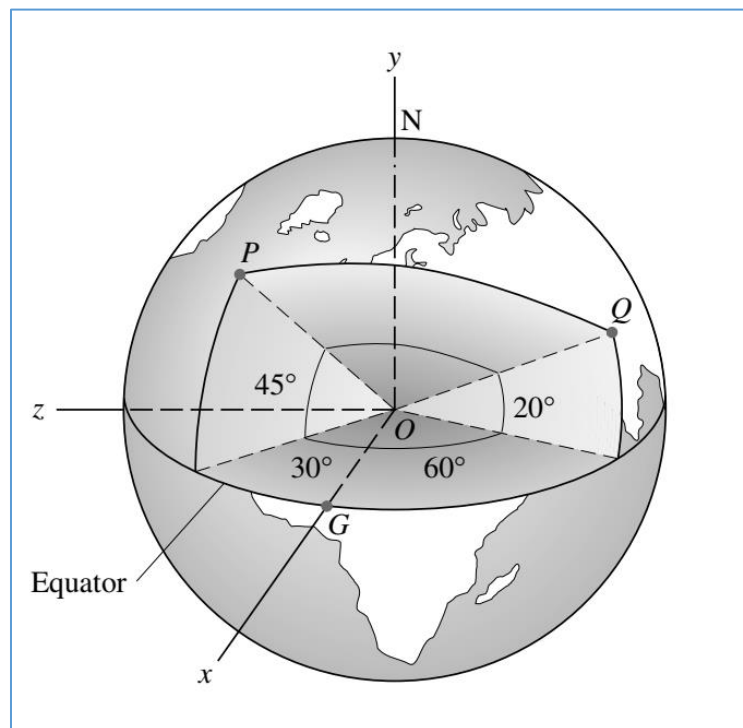
**CEE 2219: STATICS AND INTRODUCTION TO STRENGTH
OF MATERIALS**

ASSIGNMENT A4.2

**DUE DATE: 18th MAY, 2022
LET US ALL DO PHYSICAL SUBMISSION**

QUESTION 1

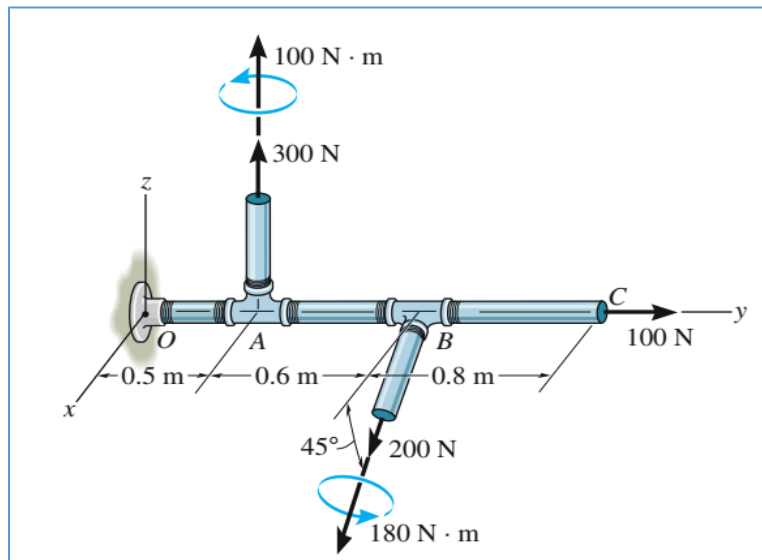
Point P is at longitude $30^{\circ}W$ and latitude $45^{\circ}N$ on the Atlantic Ocean between Nova Scotia and France. Point Q is at longitude $60^{\circ}E$ and latitude $20^{\circ}N$ in the Arabian Sea. Determine the shortest distance along the surface of the earth from P to Q . Take the radius of the earth R is **6378.1 Km**.





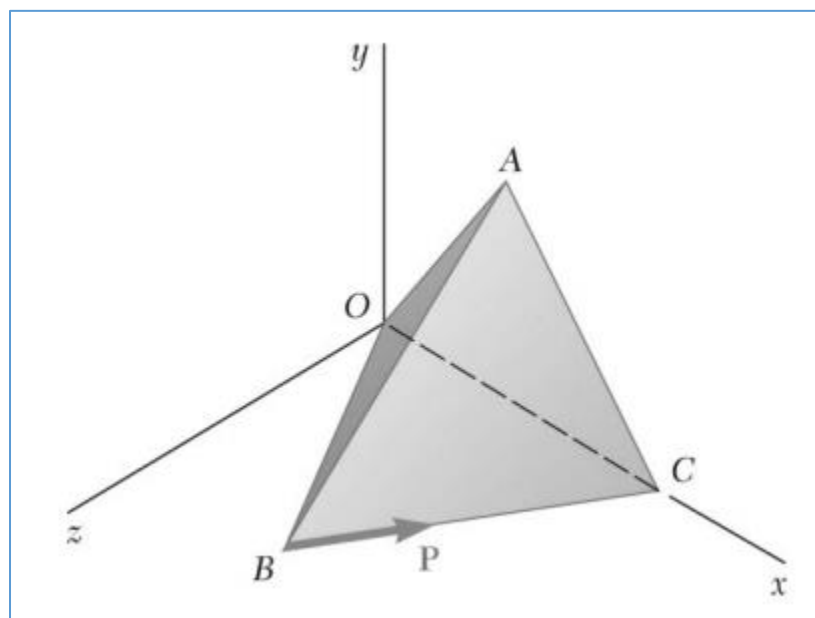
QUESTION 2

Replace the two wrenches and the force, acting on the pipe assembly, by an equivalent resultant force and couple moment at point O.



QUESTION 3

A regular tetrahedron has six edges of length a . A force \mathbf{P} is directed as shown along edge BC. Determine the moment of \mathbf{P} about edge OA.





QUESTION 4

Prove that the force-and-couple system shown can be reduced to a single equivalent force **R** and determine **R** and the point where the line of action of **R** intersects the *yz*-plane. (Note that for a system to be reduced to a single equivalent force, the resultant force and resultant moment must be perpendicular)

