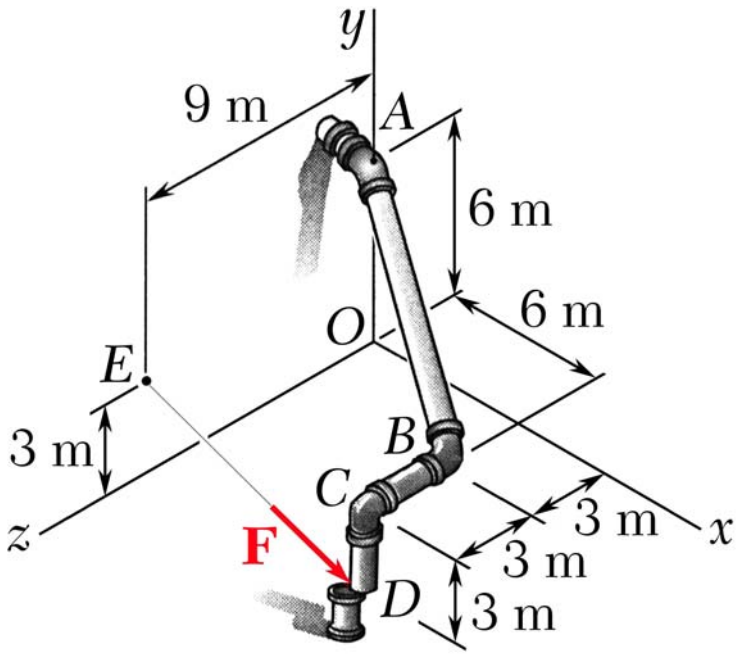
Quiz #4

A 108-N force **F** acts at the end *D* of a pipeline as shown. Determine *(a)* the moment $\mathbf{M}_A$ of the force **F** about the joint at *A*, *(b)* the moment M_{AB} of **F** about the axis of the pipe *AB*, *(c)* the shortest distance d_{s1} between the point *A* and the line of action of **F**, *(d)* the shortest distance d_{s2} between the line containing *AB* and the line of action of **F**.



(a) $\mathbf{F} = 36(2\mathbf{i} - 2\mathbf{j} - \mathbf{k})$ N ①

$\mathbf{M}_A = 756\mathbf{i} + 648\mathbf{j} + 216\mathbf{k}$ N·m ②

(b) $M_{AB} = 144$ N·m ②

(c) $d_{s1} = 9.43$ m ②

(d) $F_{\perp} = 48\sqrt{2}$ N $= 67.88$ N ①

$d_{s2} = 2.12$ m ②