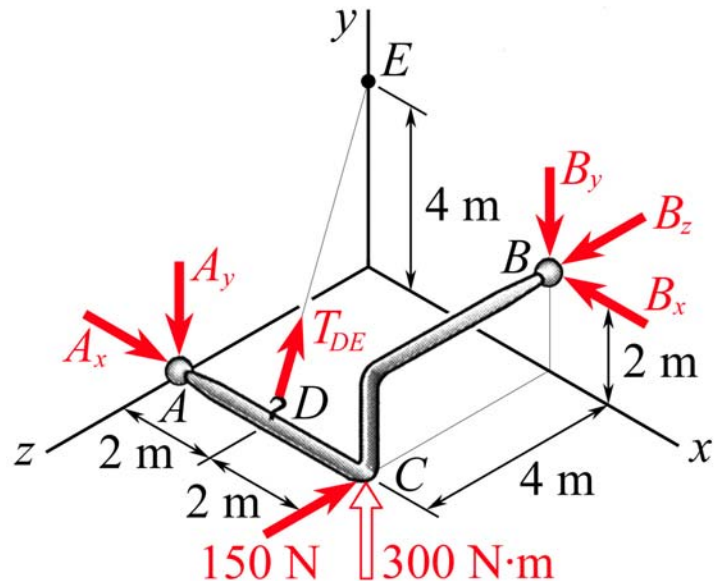# MEEG 2003 Quiz #4.m09

1. (3 points) Describe Varignon's theorem.

2. (7 points) For the force system shown, determine (*a*) the resultant moment $\mathbf{M}_A^R$ about the point *A*, (*b*) the resultant moment M_{AB}^R about the axis passing through the points *A* and *B*.

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1. Varignon's theorem states that the moment of a force about any point is equal to the sum of the moments of its components about the same point.   ③

2. $\mathbf{T}_{DE} = \dfrac{T_{DE}}{3}(-\mathbf{i} + 2\mathbf{j} - 2\mathbf{k})$ $\boldsymbol{\lambda}_{AB} = \dfrac{1}{3}(2\mathbf{i} + \mathbf{j} - 2\mathbf{k})$ ①

$$\mathbf{M}_A^R = (-4B_y + 2B_z)\mathbf{i} + (\tfrac{4}{3}T_{DE} + 4B_x - 4B_z + 900)\mathbf{j}$$
$$+ (\tfrac{4}{3}T_{DE} + 2B_x - 4B_y)\mathbf{k} \ \ \text{N·m}$$

   ③

$$M_{AB}^R = \boldsymbol{\lambda}_{AB} \cdot \mathbf{M}_A^R \qquad\qquad M_{AB}^R = 300 - \tfrac{4}{9}T_{DE} \ \ \text{N·m}$$

   ③