

Problemas Sobre El Teorema De Varignon

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Resumen—Resuelva correctamente los siguientes problemas.

F4-12. If $F_1 = \{100i - 120j + 75k\}$ lb and $F_2 = \{-200i + 250j + 100k\}$ lb, determine the resultant moment produced by these forces about point O . Express the result as a Cartesian vector.

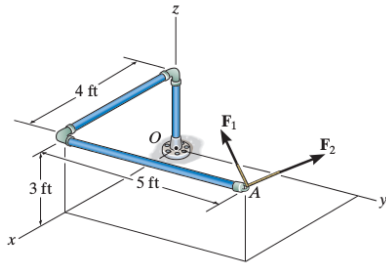


Figura 1. teorema de varignon

$$F_1 = 100i - 120j + 75k \text{ lb}$$

$$F_2 = -200i + 250j + 100k \text{ lb}$$

3D

$$M_o = \vec{r} \cdot \vec{f}$$

$$F_1 = 100i - 120j + 75k \text{ lb}$$

$$RA = 4i + 0j + 3k$$

$$F_2 = -200i + 120j + 100k \text{ lb}$$

$$RB = 4i + 5j + 3k$$

$$RA \cdot F_1 \quad i \quad j \quad k$$

$$\begin{matrix} 4 & 0 & 3 & i[(0)(75) - (-120)(3)] + \\ j[(4)(75) - (100)(3)] + k[(100)(0) - (4)(-120)] \\ 100 & -120 & 75 \end{matrix}$$

$$RA \cdot F_1 = i(360) + k(480)$$

$$RB \cdot F_2 \quad i \quad j \quad k$$

$$\begin{matrix} 4 & 5 & 3 & i[(5)(100) - (250)(3)] + \\ j[(4)(100) - (-200)(3)] + k[(4)(250) - (-200)(5)] \\ -200 & 250 & 100 \end{matrix}$$

$$RA \cdot F_2 =$$

$$i(-250) + (1000)j + (2000)k$$

$$F_B = 30 \text{ lb}$$

4-14. Two boys push on the gate as shown. If the boy at B exerts a force of $F_B = 30$ lb, determine the magnitude of the force F_A the boy at A must exert in order to prevent the gate from turning. Neglect the thickness of the gate.

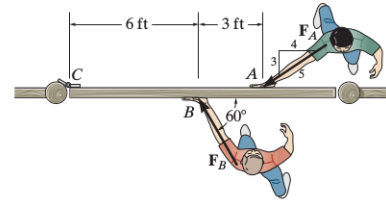


Figura 2. Teorema de varignon

$$F_A = ??$$

$$F_B = 30 \sin 60 \cdot 6 \cdot \frac{3}{5} \cdot 9 = F_A$$

$$\frac{30 \sin 60 \cdot 6}{\frac{3}{5}} = \frac{259,80}{9} = 28,86$$

$$F_A = 28,9$$