Problemas sobre el teorema de Varignon.

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Resumen

Resumen- En el presente documento se abordan las ideas básicas que se utilizaron a lo largo de unas cuantas clases ya que se utilizaron métodos para darle solución a estos.

Solucion.-

i	j	k
100	-120	75

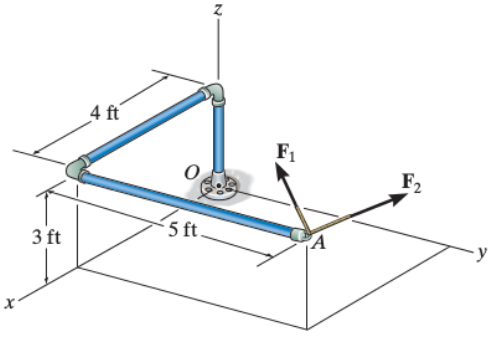
Cuadro 1: F1

i	j	k
-200	250	100

Cuadro 2: F2

Problema1.

F4–12. If $\mathbf{F}_1 = \{100\mathbf{i} - 120\mathbf{j} + 75\mathbf{k}\}$ lb and $\mathbf{F}_2 = \{-200\mathbf{i} + 250\mathbf{j} + 100\mathbf{k}\}$ lb, determine the resultant moment produced by these forces about point O. Express the result as a Cartesian vector.



$$F1 = 100i - 120j + 75k$$

$$F2 = -200i + 250j + 100k$$

$$RA = 4i + 5j + 3k \qquad F1XRB$$

$$RB = 4i + 5j + 3k \qquad F2XRA$$

i	j	k
4	5	3
100	-120	75

Cuadro 3: F1XRB

$i\,(5\,(75)-(-120)\,3)$ $-$

$j\,(4\,(75)-(100)\,3)$ $+$

$k\,(4\,(120)-(100)\,5)$

$i\,(375+360)$ $-$ $j\,(300-300)$ $+$

$k\,(-480-500)=735i-980k$

i	j	k
4	5	3
-200	250	100

Cuadro 4: F2XRA

$i\,(5\,(100)-(250)\,3)-j\,(4\,(100)-(200)\,3)+$

$k\,(4\,(250)-(-200)\,5)$

$i\,(500-750)-j\,(400+600)+k\,(1000+1000)$

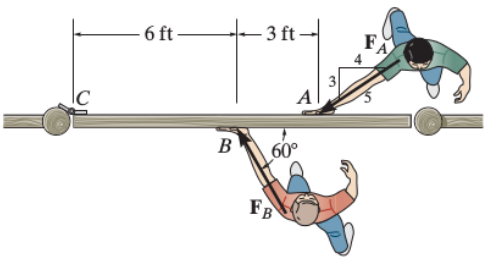
$-250-1000j+2000k$

$FT=735i-980k-250i-1000j+2000k$

$FT=485i-1000j+1020k$

Problema2.

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.



Solución.-

$ry=0$

$Fy=0$

$rx=30Sin60\,(6)$

$Fx=\left(-\frac{3}{5}\right)(9)$

$Mo=(rxFy-rxFx)$

$Mo=0\,(30Sin60\,(6))-0\left(-\frac{3}{5}\right)(9)$

$Mo=155.884+FA5.4$

$FA=\frac{155.884}{5.4}$

$FA=28.86lb$