Problemas sobre el teorema de Varignon

Jessica Aide Quirino-Murillo [1], Angel Osvaldo Quirino-Murillo[2], and yeni araceli Reyes-Lopez[1]

[1]Instituto Tecnológico Superior Zacatecas Occidente
[2]Affiliation not available

April 23, 2018

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.

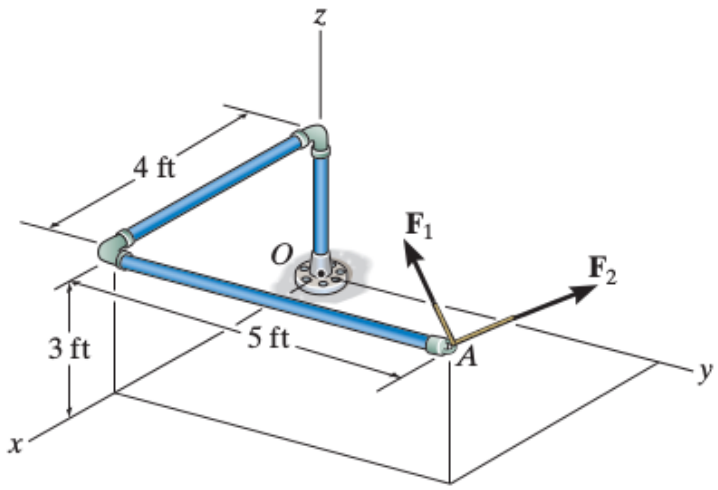

Figure 1: This is a caption

Mo= r×FF1

=100i-120j+75kF2=200i+250j+100kFR=-100i+130j+175kr=4i+5j+3kMo=i4-100j5130k3175—=i[(5*175)-(130*3)]=485ij[(4(3*-100)]=-1000jk[(4*130)-(-100*5)]=1020kMo=485i-1000j+1020kMo=rxFF1=100i-120j+75kF2=200i+250j+100kFR=-100i+130j+175kr=4i+5j+3kMo=|ijk453-100130175|=i[(5*175)-(130*3)]=485ij[(4*175)-(3*-100)]=-1000jk[(4*130)-(-100*5)]=1020kMo=485i-1000j+1020k

FA: 30 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.

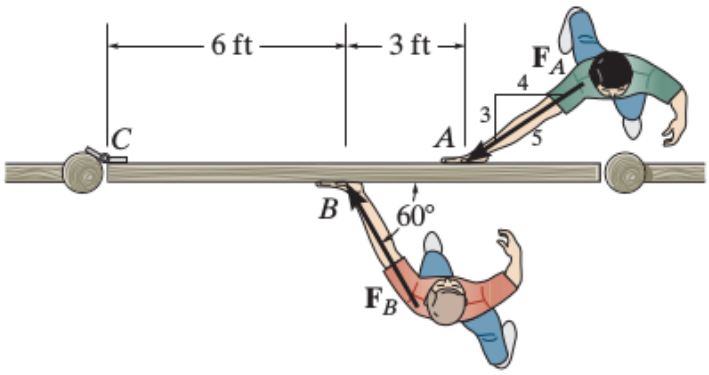

Figure 2: This is a caption

Fa: ?

fa x

fa cos θ 4/5 f A

f a y fa senθ 3/6 f a

Fa x= 60

Fa y= 60

Ma=fax fay -FAY FAX

=(9FT) (3/5FA)-(0) (4/3)F.A

27/3 FT IB FT

M0= Y0X Y0Y- Y0Y Y0X

(6FT) (30IB SEN60) =155.9 IB FT

ΣM=0

M0-M0=0

155.8 IB -FT (27/5) F0- 30COS60)

27/5 FA=155.58

F.A$\left(\frac{158.8}{}\right)$IB FT

28.9 IB FT

Σ fx -0

-fax-fAx=0

-30lb cos 60-4/5 Fa-0

4/5 (-30 IB COS60)