Prova 2

quinta-feira, 5 de novembro de 2020 07:12

Lucas Lima - 11721EMT014

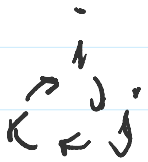
1)

$F_y = -F\cos\theta_y = -200 \cdot \cos 30 = -173{,}21\ N$

$F_z = F\cos\theta = 100\ N$

$F_x = 0$

$\vec{F} = (0\ ;\ -173{,}21\ ;\ 100)\ N$



$B(0;0;0)$

$C = (0{,}06\ ;\ 0{,}025\ ;\ 0)$

$\vec{BC} = (0{,}06\ ;\ 0{,}025\ ;\ 0)$

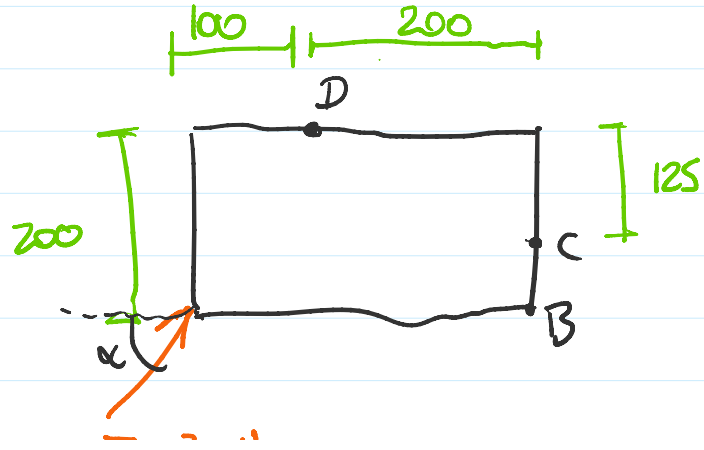
$\vec{M} = \vec{r} \times \vec{F}$

$(0{,}06i + 0{,}025j + 0z) \times (0\ ;\ -173{,}21\ ;\ 100)\ N$

$\vec{M} = (-10{,}4k - 6j + 2{,}5i)\ N.m$

$\vec{M} = (2{,}5i - 6j - 10{,}4k)\ N.m$

2)



A(0;0;0)

xy

F = 300 N

α = 28°

A(0; 0; 0)

D(0,1; 0,2; 0)

$\vec{M} = (0,1\,i + 0,2\,j + 0\,k) \times (271,9\,i + 126,8\,j + 0\,k)$

$\overrightarrow{AD}(0,1\,i + 0,2\,j + 0)$

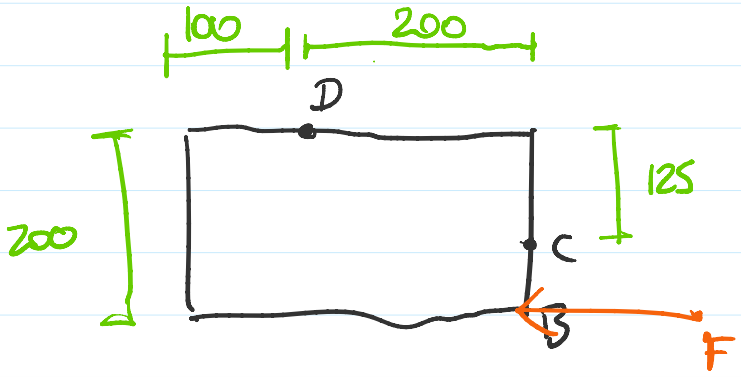
$12,68\,k + 54,38\,k$

$\vec{F}(F\cdot\cos 25, F\sin 25)$

$\vec{F}(271,9,\ 126,8)$

$\vec{m} = -41,7\,k$

$\vec{m} = -41,7\ N\cdot m$



F(x, 0y)

$\vec{m} = \vec{r} \times \vec{F}$

B(0,3i 0 ;0)

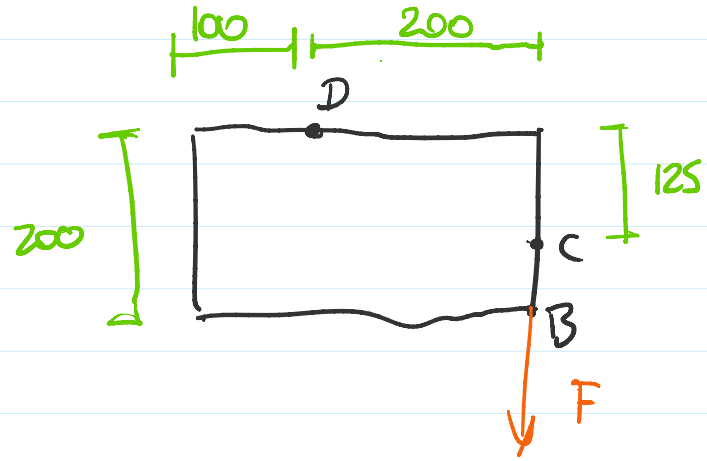
D(0,1; 0,2;0)

$-41,7\,k = (-0,2\,i + 0,2\,j) \times (x\,i)$

$\overrightarrow{BD}(-0,2; 0,2; 0)$

$-41,7\,k = -0,2\,k \cdot x$

$x = \frac{+41,7}{0,2} = 208,5\ N$



$F(0; -y\,j)$

$\vec{M} = \vec{r} \times \vec{F}$

$B(0{,}3i\ 0\ ;0)$
$D(0{,}1\ ;\ 0{,}2i;0)$

$-41{,}7\,k = (-0{,}2i + 0{,}2j) \times (-y\,j)$

$\overrightarrow{BD}\ (-0{,}2;0{,}2;0)$

$-41{,}7k = +0{,}2k\,y$

$y = -208{,}5\ N$

11)

$\overrightarrow{BA} = |BA| \cdot \lambda_{BA}$

$|BA| = 555\ N$

$|BC| = 660\ N$

$\overrightarrow{BC} = |BC| \cdot \lambda_{BC}$

$A(-0{,}75\ ;\ 0\ ;\ 6)$

$\overrightarrow{BA} = 555 \cdot (-0{,}08\ ;-0{,}75\ ;\ 0{,}64)$

$B(0;7;0)$

$\overrightarrow{BA} = (-44{,}4\,i - 416{,}25\,j + 355{,}2\,k)\ N$

$C(4{,}25;0;1)$

$\overrightarrow{BA}\ (-0{,}75;-7;1)$

$\vec{BA}\ (-0{,}75;\ -7;\ 6)$

$\vec{BC}\ (4{,}25;\ -7;\ 1)$

$\vec{BC} = 660 \cdot (0{,}51\ i - 0{,}84;\ 0{,}12)$

$\vec{BC} = (336{,}6\ i - 554\ j + 79{,}2\ k)\ N$

$F_R = \sum \vec{F}$

$F_R = 292{,}2\ i - 970{,}25\ j + 434{,}4\ k\ \ |\ N$

$K = i$

$\vec{M}$ $\quad i \quad j \quad K \quad i \ j \ K$

$(292{,}2\ i - 970{,}25 + 434{,}4) \times (0;\ -7;\ 0)$

$-2045{,}4 + 2040{,}8\ i = 3663\ Nm$