Clave B

PrepaTec Departamento de ciencias PrepaTec Toluca Tecnológico de Monterrey	Energy & Transformation PC 6046 Grupo:	Professor: Alejandro Portales
	Partial Exam	February 16, 2022
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	ID:	
	B	
	Points	

1) Find the angles and magnitude of the following vector

A= (21, -45, 65)

$\|A\| = 81.79$

$\theta_x = 75.12°$

$\theta_y = 123.38°$

$\theta_y = 37.37°$

2) Find the cross and dote product of the following two vectors.

A= (5, 3, -6) B= (-1, 9, 7)

i	j	k	i	j
5	3	-6	5	3
-1	9	7	-1	9

$A \times B = 75i - 29j + 48k$

$A \cdot B = -20$

3) Find the angle between the two given vectors

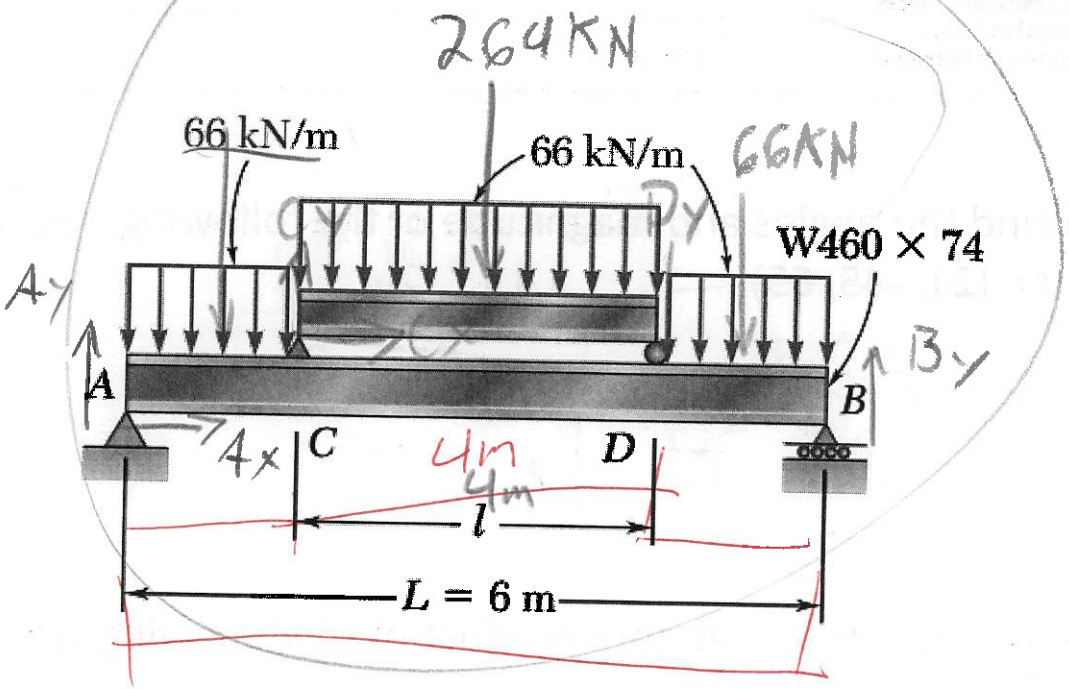
A= (8, 16, -9) B= (4, -16, 5)

$\cos^{-1}\left(\frac{A \cdot B}{\|A\|\|B\|}\right) \Rightarrow \left(\frac{-269}{345.10}\right)$

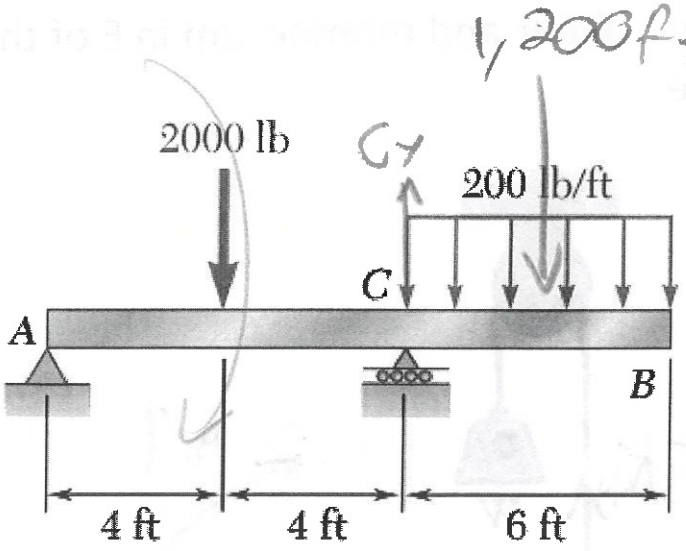
$38.78°$

$\chi = 141.21$

4) Draw the complete FBD for the following exercise, showing the resultant forces made by the distributed force, and the reaction force of the two supports (just the vector).



5) Find the reaction force in connector C



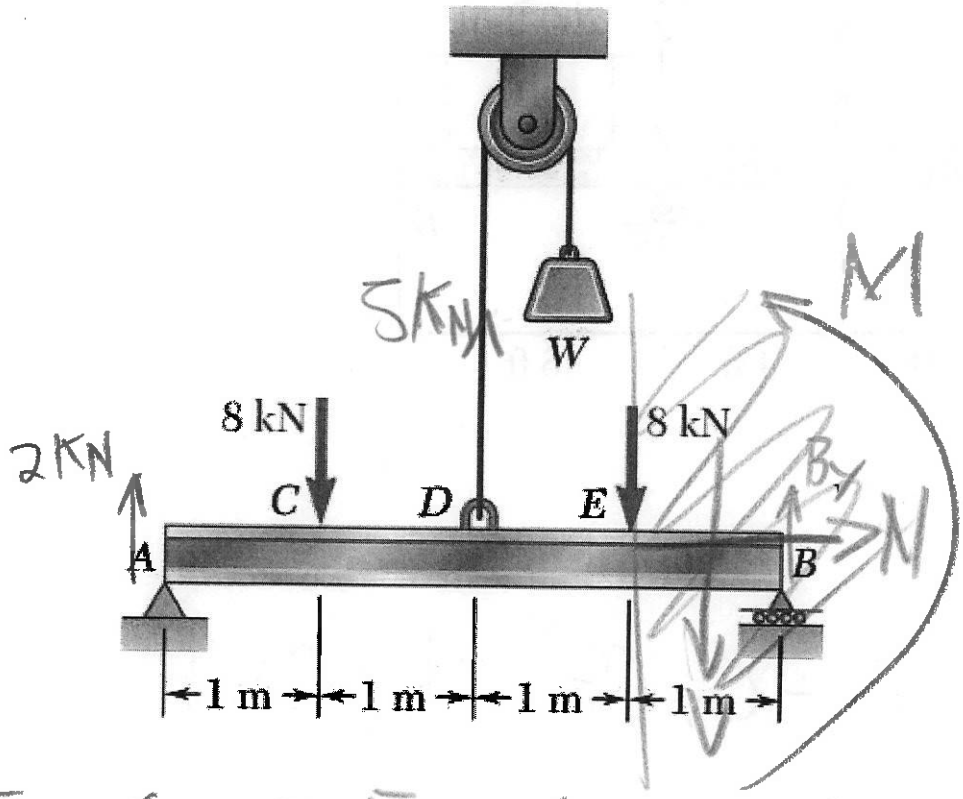
$\Sigma M_A = \emptyset$

$-8{,}000 \quad -13{,}200$

$-2{,}000(4) + C_y(8) - 1{,}200(11) = \emptyset$

$C_y = +2{,}650\,Lb$

6) Assume the reaction in A is equal to 2kN and W=5KN, calculate normal, shear and momentum in E of the following figure.



$\Sigma F_x = 0$

$N = 0$

$\Sigma F_y = 0$

$2 - 8 + 5 - 8 - V = 0$

$V = -9\,kN$

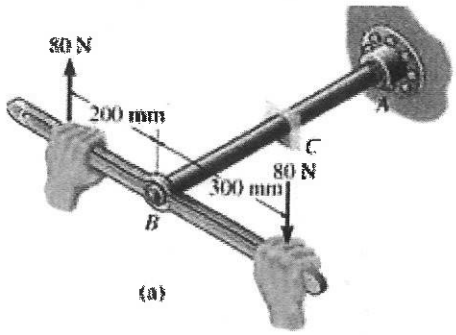
$\Sigma M_E = 0$

$-2(3) + 8(2) - 5(1) - M = 0$

$M = 5\,kN \cdot m$

EXTRA (5pts)

7) Find the total Torsion in C



$$-80(.2) - 80(.3) = \emptyset$$

$$T = 40\ N \cdot m$$