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Nombre del profesor: Juan José Ojeda

Nombre del trabajo: ejercicios

Materia: física 1

Grado: 4to cuatrimestre

Grupo: técnico en administración de recursos humanos

Comitán de Domínguez Chiapas a 02 de diciembre de 2021

NORMA VALERIA RODRIGUEZ CALINDO ①

UN SEMAFORO ESTA SUSPENDIDO DE DOS SOPORTES. LAS TRES FUERZAS QUE ACTUAN APARTIR DEL PUNTO COMUN SON

EL PESO DEL SEMAFORO QUE ES DE 500 Nw Y QUE ACTUA DE LINEA RECTA HACIA ABAJO: FY, QUE ES LA TENCION DE UN CABLE A 45° HACIA ARRIBA Y LA IZQUIERDA F2 QUE ES OTRO CABLE A 30° HACIA ARRIBA

CALCULAR LAS TENCIONES DE F1 Y F2 APARTIR DE UN DIAGRAMA DE CUERPO LIBRE

$F_{1x} = F_1 \cos 135°$

$F_{1x} = -0.707\ F_1$

$F_{1y} = F_1 \operatorname{sen} 135°$

$F_{1y} = 0.707\ F_1$

$F_{2x} = F_2 \cos 30°$

$F_{2x} = 0.860\ F_2$

$F_{2y} = F_2 \operatorname{SEN} 30°$

$F_{2y} = 0.5\ F_2$

$\Sigma F_x = 0$

$F_{1x} + F_2 = 0$

$-0.707\ F_1 + 0.866\ F_2 = 0$

$\Sigma F_y = 0$

$F_{1y} + F_{2y} - P = 0$

$0.707\ F_1 + 0.5\ F_2 = 500$

$-0.707\ F_1 + 0.866\ F_2 = 0$

$0.707\ F_1 + 0.5\ F_2 = 500$

$1.366\ F_2 = 500N$

$F_2 = \frac{500\ N}{1.366}$

$F_2 = 366.032\ Nw$

SUST. F2 EN ICU ①

$-0.707\ F_1 + 0.866\ (366.032\ N) = 0$

$-0.707\ F_1 + 316.98 = 0$

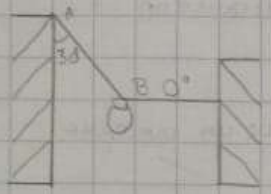
$-0.707\ F_1 = -316.98N$

$F_1 = \frac{-316.98\ N}{-0.707}$

$F_1 = 448.34N$

NORMA VALERIA RODRIGUEZ GALINDO ②

UNA PELOTA DE ACERO DE 100 NW SUSPENDIDA DEL CORDEL A ES TIRADA HACIA UN LADO POR UN CORDEL B Y MANTENIDA DE TAL FORMA QUE EL CORDEL A FORMA UN ANGULO DE 30° CON LA PARED VERTICAL (CALCULA LAS TENCIONES DE LOS CORDES A Y B Y MUESTRA EL DIAGRAMA DE CUERPO LIBRE)



$\Sigma T_y = 0$

$T_{1y} + T_{2y} - P = 0$

$0.866 T_1 - 100 NW = 0$

$T_1 = \frac{100 NW}{0.866}$

$T_1 = 115.47 NW$

$F_{1x} = F_1 \cos 120°$

$F_{1x} = -0.5 T_1$

$F_{1y} = F_1 \operatorname{sen} 120°$

$0.866 T_1$

SUST. T1 EN *

$F_{2x} = F_2 \cos 0°$

$T_2 = 1 T_2$

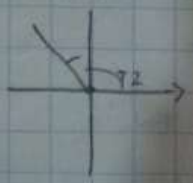
$-0.5 (115.47) * T_2 = 0$

$-57.5 + T_2 = 0$

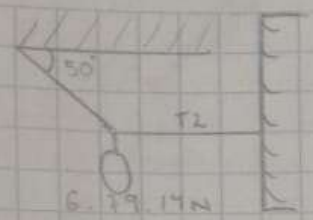
$F_{2y} = F_2 \operatorname{Sen} 0°$

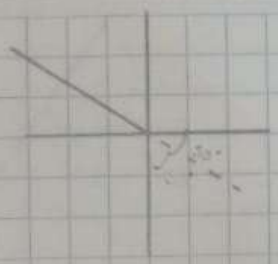
$F_{2y} = 0$

$T_2 = 57.5 NW$



NORMA VALERIA RODRIGUEZ GALINDO ③





$T_{1x} = T_1 \cos 130°$
$T_{1X} = -0.642 T_1$
$T_{1y} = T_1 \text{ SEN } 130°$
$T_1 y = 0.766 T_1$

$T_{2x} = T_2 \cos 0$
$T_{2x} = T_2$

$T_{2y} = T_2 \text{ SEN } 0$
$T_2 y = 0$

$\Sigma T_x = 0$

$T_{1x} + T_{2x} = 0$

$\boxed{-0.642 T_1 + T_2 = 0}$

$\Sigma T_1 = 0$

$T_{1y} + T_{2y} - P = 0$

$0.766 T_1 = 679.14$

$T_1 = \frac{679.14}{0.866}$

$\boxed{T_1 = 886.60N}$

$-0.642 T_1 + T_2 = 0$

$-0.642 (886.60N) + T_2 = 0$

$-569.20N + T_2 = 0$

$\boxed{T_2 = 569.20 N}$

NORMA VALERIA RODRIGUEZ CALIXTO (4)

$F1x = F1 \cos 170°$

$-0.984\ T1$

$F1y = F1 \operatorname{SEN} 170°$

$F1y = 0.173\ T1$

$F2x = F2 \cos 5°$

$F2x = 0.996\ T2$

$F2y = F2 \operatorname{sen} 5°$

$F2y = 0.087\ T2$

$\Sigma Tx = 0$

$T1x + T2x = 0$

$-0.984\ T1 + 0.996\ T2 = 0$

$\Sigma Ty = 0$

$T1y + T2y = P$

$0.173\ T1y + 0.087\ T2y = 90N$

DESP (T2) DE ECU. (1)

$-0.984\ T1 + 0.996\ T2 = 0$

$0.996\ T2 = 0.984\ T1$

$T2 = \dfrac{0.984\ T1}{0.996}$

$T2 = 0.987\ T1$

SUST EN (2)

$0.173\ T1 + 0.087\ T2 = 90$

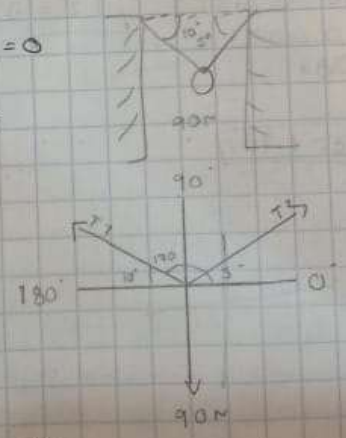
$0.173\ T1 + 0.087\ (0.987\ T1) = 90$

$0.173\ T1 + 0.085\ T1 = 90$

$0.258\ T1 = 90$

$T1 = \dfrac{90}{0.258}$

$T1 = 348.83\ N$



$T2 = 0.987\ (348.83\ N)$

$T2 = 344.29\ N$

NORMA VALERIA RODRIGUEZ GALINDO (5)

METODO DE IGUALACION

LAS ECU ① ② DESP ②

$-0.984\ T_1 + 0.996 T_2 = 0$

$0.996 T_2 = 0.984\ T_1$

$T = \frac{0.984\ T_1}{0.996}$

$T_2 = 0.987\ T_1$

DESP ② DE ②

$0.173\ T_1 + 0.089\ T_2 = 90$

$0.089\ T_2 = 90 - 0.173 T_1$

$T_2 = \frac{90 - 0.173 T_1}{0.089}$

$T_2 = 1034.48 - 1.98 T$

$T_2 = T^2$

$0.987\ T_1 = 1034.48 - 1.98\ T_1$

$0.987\ T_1 + 1.98 T_1 = 103$

$2.967\ T_1 = 1034.48$

$T_1 = \frac{1034.48}{2.967}$

$T_1 = 348.66\ Nw$

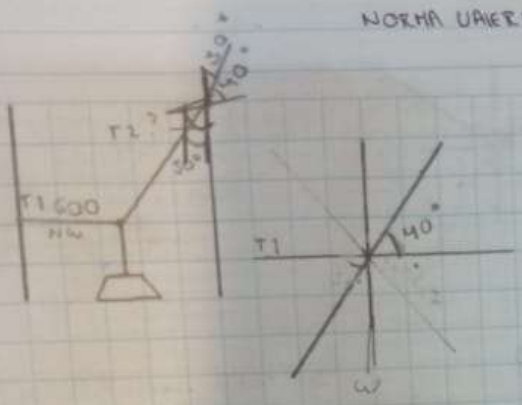
$T_2 = 0.98 + T_1$

$T_2 = 0.987\ (348.66\ Nw$

$T_2 = 3'14.12$

NORMA UAMERIA RODRIGUEZ GALINDO

⑥



$T_{1x} = 600 \cos 180°$

$T_{1x} = -600\, T_1$

$T_{1y} = 600 \operatorname{Sen} 180°$

$T_{1y} = 0\, T_1$

$T_{2x} = T_2 \cos 40°$

$T_{2x} = 0.766\, T_2$

$T_{2y} = T_2 \operatorname{Sen} 40°$

$T_{2y} = 0.642\, T_2$

$\Sigma T_x = 0$

$T_{1x} + T_{2x} = 0$

$-600 T_1 + 0.766 T_2 = 0 T_1 - 600\ NW$

0.766

$T_2 = 783.28$

$\Sigma T_Y = 0$

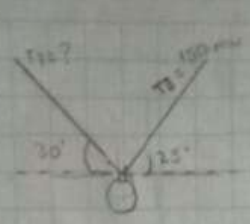
$T_{1y} + T_{2y} - W = 0$

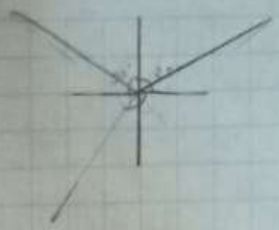
$0.642\, T_2 - W = 0$

$0.642\,(783.28\ NW) = W$

$502.86\ NW = W$

NORMA UMERIA RODRIGUEZ CALINDO ①





$T_h = T_1 \cos 150°$

$T_h = -0.866\ T_1$

$T_{1y} = T_1 \operatorname{sen} 150°$

$T_{1y} = 0.5\ T_1$

$T_{2x} = 150 \cos 25°$

$T_{2x} = 135.946$ Nw

$T_{2y} = 150 \operatorname{sen} 25°$

63.39 Nw

ΣT_x

$T_{1x} + T_{2x} = 0$

$-0.866\ T_1 + 135.946\ Nw = 0$

$135.946 = 0.866\ T_1$

$\frac{135.946}{0.866} = T_1$

$T_1 = 156.981$

$\Sigma T_1 = 0$

$T_{1y} + T_{2y} - w = 0$

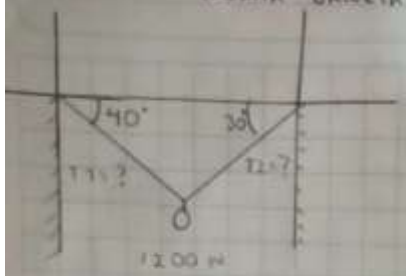
$0.5\ T_1 + 63.39\ Nw - w = 0$

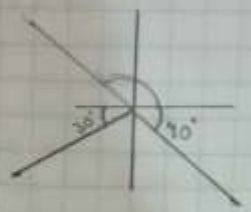
$0.5\ T_1 (156.981) + 63.39 =$

$78.49 + 63.39 =$

$w = 141.88$

NORMA VALERIA RODRIGUEZ GALINDO (8)





$T_{1x} = T_1 \cos 140°$

$T_{1x} = -0.766\, T_1$

$T_{1y} = T_1 \operatorname{Sen} 140°$

$0.642\, T_1$

$T_{2x} = T_2 \cos 30°$

$0.866\, T_2$

$T_{2y} = T_2 \operatorname{Sen} 30°$

0.5

ΣT_x

$T_{1x} + T_{2x} = 0$

$-0.766\, T_1 + 0.866\, T_2 = 0$

$T_2 = 0.88\, T_1$

$T_1 = 1.13\, T_2$

$\Sigma T_y = 0$

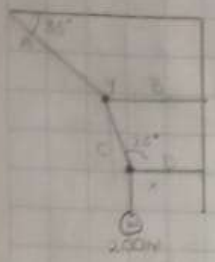
$T_{1y} + T_{2y} - w = 0$

$0.642\, T_1 + 0.5 = 1200$

NORMA URIEL A RODRIGUEZ GALINDO ⑨ 30/NOVIEMBRE/2021

Cambio el angulo por el punto de analisis

Siempre se comienza de abajo hacia arriba



$C_x = C \cos 115$

$C_x = -0.422\,C$

$C_y = C \operatorname{SEN} 115$

$C_y = 0.906\,C$

$D_x = D \cos 0$

$D_x = D$

$D_y = D \operatorname{SEN} 0$

$D_y = 0$

$\Sigma x = 0$

$C_x + D_x = 0$

$-0.422C + D = 0$

$\boxed{D = 0.422C}$

$\Sigma y = 0$

$C_y + D_y = W$

$0.906\,C = 200\,N$

$C = \frac{200\,N}{0.906}$

$\boxed{C = 220.75\,N}$

$D = 0.422\,C$

$D = 0.422\,(220.75\,N)$

$\boxed{D = 93.15\,N}$

$A_x = A \cos 145^\circ$

$A_x = -0.819\,A$

$A_y = A \operatorname{Sen} 145$

$A_y = 0.573A$

$B_x = B \cos 0^\circ$

$B_x = B$

$B_y = 0$

$C_x = 220.7 \cos 335^\circ$

$C_x = 200.02\,N$

$C_y = 220.7 \operatorname{SEN} 335^\circ$

$C_y = -93.27\,N$

$\Sigma x = 0$

$A_x + B_x + C_x = 0$

$-0.819A + B + 200.02\,N = 0$

$\boxed{-0.819A + B = 200.02\,N}$

$\Sigma y = 0$

$A_y + B_y + C_y = 0$

$0.573\,A = 93.27\,N$

$A = \frac{93.27\,N}{0.573}$

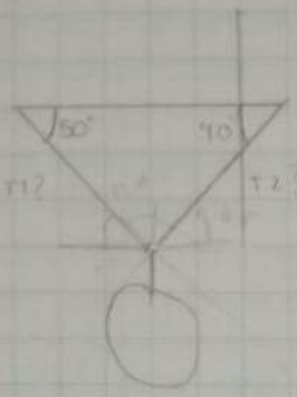
$\boxed{A = 162.77\,N}$

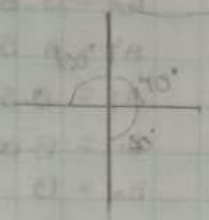
$-0.819\,(162.77\,N) + 133.30 + B = 200.02$

$B = 200.02 + 133.30$

$\boxed{B = 333.32\,N}$

NORMA VALERIA RODRIGUEZ GALINDO (10)





$T_{1x} = T_1 \cos 130°$

$T_{1x} = -0.642\ T_1$

$T_{1y} = T_1 \operatorname{Sen} 130°$

$T_{1y} = 0.766\ T_1$

$T_{2x} = T_2 \cos 40°$

$T_{2x} = 0.766\ T_2$

$T_{2y} = T_2 \operatorname{SEN} 40$

$T_{2y} = 0.642\ T_2$

$\Sigma T_x = 0$

$T_{1x} + T_{2x} = 0$

$-0.642 T_1 + 0.766 T_2 = 0$

$0.766 T_2 = 0.642 T_1$

$\Sigma T_y = 0$

$T_{1y} + T_{2y} - P = 0$

$0.766 T_1 + 0.642 T_2 - 50\ Kg = 0$

$0.766 T_1 + 0.642 T_2 = 50\ Kg$

$(0.766)(-0.642 T_1 + 0.766 T_2 = 0)$

$(0.642)(0.766 T_1 + 0.642 T_2 = 50\ Kg)$

$-0.491 + 0.586 = 0$

$0.491 + 0.492 = 32.1\ Kg$

$0.998 = 32.1\ Kg$

$T_2 \quad 32.1\ Kg$

0.998

$T_2 = 32.164$

$-0.491 + 0.586\ (32.164) = 0$

$0.491 + 18.84 = 0$

18.84

0.491

$T_1 = 38.37$

NORMA VALERIA RODRIGUEZ GALINDO (11)

$T_{1x} = T_1 \cos 60°$

$T_{1x} = 0.5\ T_1$

$T_{1y} = T_1 \operatorname{sen} 60°$

$T_{1y} = 0.86\ T_1$

$T_{2x} = 600N \cos 180°$

$T_{2x} = -600$

$T_{2y} = 600N \operatorname{sen} 180°$

0

$\Sigma T_x = 0$

$T_{x1} + T_{x2} = 0$

$0.5\ T_1 + -600 T_2 = 0 \quad T_1 = \frac{600 T_2}{0.5 T_1}$

$T_1 = 1200$

$\Sigma T_y = 0$

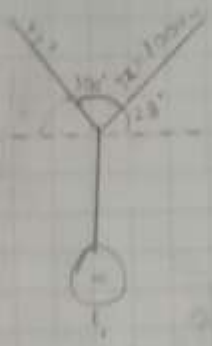
$T_{1y} + T_{2y} - w = 0$

$0.86 T_1 - w = 0$

$0,86\ (1200) = w$

$1,032\ Nw = w$

NORMA VALERIA RODRIGUEZ GALINDO (12)



$T_{1x} = T_1 \cos 100°$

$T_{1x} = -0.17 T_1$

$T_{1y} = T_1 \text{ SEN } 100°$

$T_{1y} = 0.98 T_1$

$T_{2x} = 1{,}000 \cos 28°$

$T_{2x} = 882 T_2$

$T_{2y} = 1{,}000 \text{ SEN } 28°$

$469.47 T_2$

$\Sigma T_x = 0$

$T_{1x} + T_{2x} = 0$

$-0.17 T_1 + 882 T_2 = 0$

$-0.17 T_1 = +882 T_2$

$T_1 = \dfrac{-882 T_2}{-0.17}$

$T_1 = 5{,}188.23$

$\Sigma T_y = 0$

$T_{1y} + T_{2y} - w = 0$

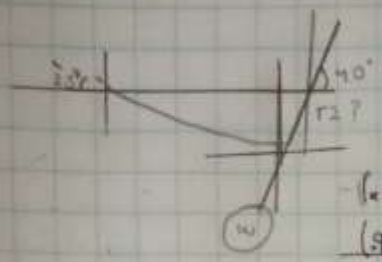
$0.98 T_1 + 469.47 T_2 = w$

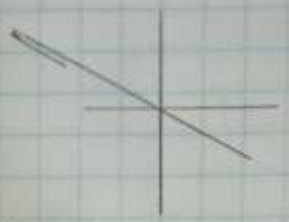
$0.98 T_1 \; (= 188.22 T_1) + 469.47 T_2 = w$

$5{,}553.93 n = w$

NORMA UAIERIA
RODRIGUEZ GALINDO

(13)





$T_{1x} = T_1 \cos 155°$
$T_{1x} = -0.906\, T_1$

$T_{1y} = T_1 \operatorname{sen} 155°$
$T_{1y} = 0.422\, T_1$

$T_{2x} = T_2 \cos 40°$
$T_{2x} = 0.766\, T_2$

$T_{2y} = T_2 \operatorname{sen} 40°$
$T_{2y} = 0.647\, T_2$

ΣT_x

$T_{x1} + T_{x2} = 0$

$-0.906\, T_1 + 0.766 T_2 = 0$
$0.766 = 0.906$

ΣT_y
$T_{1y} + T_{2y} - P = 0$
$0.422 T_1 + 0.647\, T_2 = 0$
$0.422 T_1 + 0.47 T_2 = 500N$

$(.422)\ (-0.906 T_1 + 0.766 T_2 = 0)$
$(.906)\ (0.422 T_1 + 0.47 T_2 = 500)$

$-0.382 T_1 + 0.323 T_2 = 0$
$0.382 T_1 + 0.425 T_2 = 453N$
0.748
$T_2 = \frac{453N}{0.748}$
0.748

$T_2 = 605.61\ N$

$-0.382 T_1 + 0.323 (605.61) = 0$
$0.382 T_1 + 195.23 = 0$
$T_1 = \frac{195.23}{0.382}$

$T_1 = 511.07\ N$