Nombre de alumnos: ALAN FRANCISCO GALLEGOS MORALES

Nombre del profesor: JUAN JOSE OJEDA

Nombre del trabajo: PROBLEMARIO

Materia: FISICA

Grado: 4to CUATRIMESTRE

Grupo: BRH05EMCO120-A

①

Un semaforo está suspendido de dos soportes. Las tres fuerzas que actuan a partir del punto común son, el peso del semaforo que es de 500 Nw y que actuan en linea recta hacia abajo; F1, que es la tención de un cable a 45° hacia arriba y a la izquierda; F2 que es otro cable a 30° hacia arriba, ¿calcular las tenciones de F1 y F2, a partir de un programa llamado cuerpo libre?:

$F_1x = F_1 \cos 135°$

$F_1x = -0.707 F_1$

$F_1y = F_1 \sen 135°$

$F_1y = 0.707 F_1$

$F_2x = f_2 \cos 30°$

$F_2x = 0.866 F_2$

$F_2x = f_2 \sen 30°$

$F_2y = 0.5 F_2$

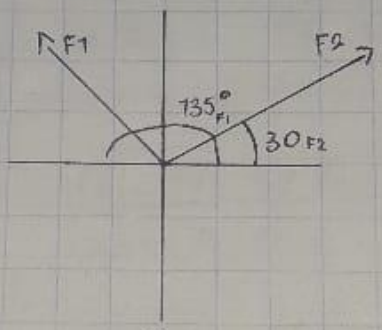
$\sum Fx = 0$

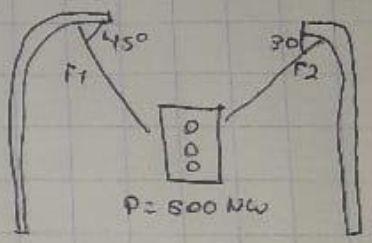
$F_1x + F_2x = 0$

$-0.707 F_1 + 0.866 F_2 = 0$

$\sum Fy = 0$

$0.707 F_1 + 0.5 F_2 = 500 Nw$





$-0.707 F_1 + 0.866 F_2 = 0$

$0.707 F_1 + 0.5 F_2 = 500 N$

$1.366 F_2 = 500 N$

$F_2 = \frac{500 N}{1.866}$

$F_2 = 366.032 Nw$

Sust. F_2 en ecu ①

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

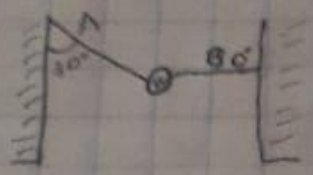
$-0.707 F_1 + 316.98 = 0$

$-0.707 F_1 = -316.98 N$

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

$F_1 = 448.34 N$

una esfera de acero de 100 lbw suspendida del cordel (A) es jalada hacia un lado por otro cordel (B) y mantenida de tal forma que el cordel (B) forma un angulo de 90° con la pared vertical. Calcula las tensiones de los cordeles (A) y (B) y muestra el diagrama de cuerpo libre?



$T_1x = T_1 \cos 120°$

$* T_1x = -0.5 T_1$

$T_1y = T_1 \text{ sen } 120°$

$T_1y = 0.866 T_1$

$T_2x = T_2 \cos 0°$

$* T_2x = T_2$

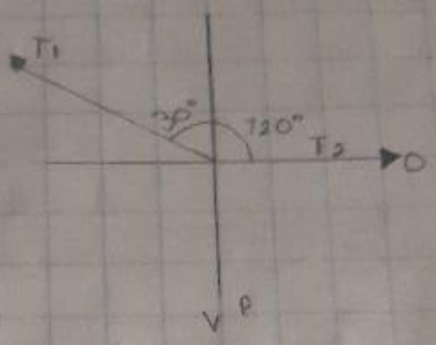
$T_2y = T_2 \text{ sen } 0°$

$T_2y = 0$

$\Sigma Tx = 0$

$T_1x + T_2x = 0$

$\boxed{-0.5 T_1 + T_2 = 0} *$



$\Sigma Ty = 0$

$T_1y + T_2y - P = 0$

$0.866 T_1 - 100 \text{ Nw} = 0$

$T_1 = \frac{100 \text{ Nw}}{0.866}$

$\boxed{T_1 = 115.47 \text{ Nw}}$

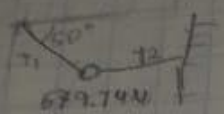
sust. T_1 en $*$

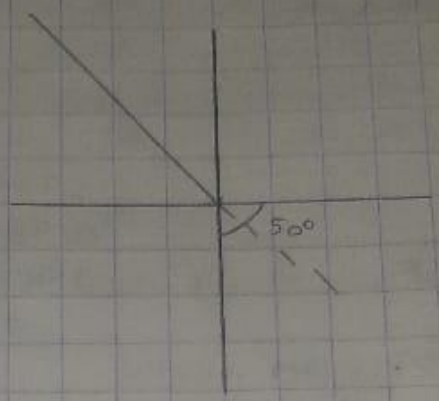
$-0.5 (115.47) + T_2 = 0$

$-57.6 + T_2 = 0$

$\boxed{T_2 = 57.5 \text{ Nw}}$

③





$T_{1X} = T_1 \cos 120°$

$T_{1X} = -0.5$

$T_{1Y} = T_1 \text{ sen } 120°$

$T_{1Y} = 0.866$

$T_{2X} = T_2 \cos 0°$

$T_{2X} = T_2$

$T_{2Y} = T_2 \text{ sen } 0°$

$T_{2Y} = 0$

$\Sigma T_X = 0$

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

$0.766\ T_1 = 679.14$

$T_1 = 674.14$

0.866

$\Sigma T_X = 0$

$T_{1X} + T_{2Y} = 0$

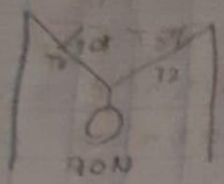
$\boxed{-0.642 t_1 + t_2 = 0}$

$-0.642\ T_1 + T_2 = 0$

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

$-569.20\ N + T_2 = 0$

$\boxed{T_2 = 569.20\ N}$



$T_{1X} = T_1 \cos 170°$

$T_{1X} = -0.984\ T_1$

$T_{1Y} = T_1 \operatorname{sen} 170°$

$T_{1Y} = 0.173$

$T_{2X} = T_2 \cos 5°$

$T_{2X} = 0.996\ T_2$

$T_{2Y} = T_2 \operatorname{sen} 5°$

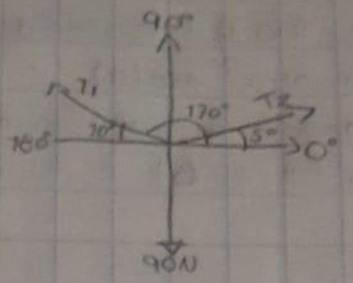
$T_{2Y} = 0.087\ T_2$

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

$-0.984\ T_1 + 0.996\ T_2 = 0$

$T_{1Y} + T_{2Y} = P$

$0.173\ T_1 + 0.087\ T_2 = 90N$



Desde (2) de ecu (1)

$-0.984\ T_1 + 0.996\ T_2 = 0$

$0.996\ T_2 = 0.984\ T_1$

$T_2 = \dfrac{0.984\ T_1}{0.996}$

$T_2 = 0.987\ T_1$

SUST EN (2)

$0.173\ T_1 + 0.087\ T_2 = 90$

$0.173\ T_1 + 0.087\ (0.987\ T_1) = 90$

$0.173\ T_1 + 0.085\ T_1 = 90$

$0.258\ T_1 = 90$

$T_1 = \dfrac{90}{0.258}$

$T_1 = 348.83\ N$

$T_2 = 0.987\ (348.83\ N)$

$T_2 = 344.29\ N$

Metodo de eguaiacpón

$-0.984\,T_1 + 0.996\,T_2 = 0$

$0.996\,T_2 = 0.984\,T_1$

$T_2 = \frac{0.984\,T_1}{0.996}$

$\boxed{T_2 = 0.987\,T_1}$ *

DESP (12) D+ (2)

$0.173\,T_1 + 0.087\,T_2 = 90$

$0.087\,T_2 = \frac{90 - 0.173\,T_1}{0.087}$

$\boxed{T_2 = 1034.48 - 1.98\,T_1}$ *

$T_2 = T_2$

$0.987\,T_1 = 1034.48 - 1.98\,T_1$

$0.987 + 1.98\,T_1 = 1034.48$

$2.967\,T_1 = 1034.18$

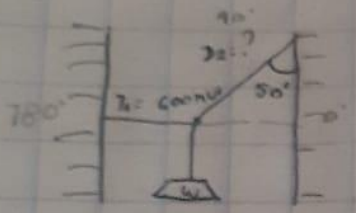
$T_1 = \frac{1034.48}{2.967}$

$\boxed{T_1 = 348.66\ NW}$

$T_2 = 0.987\,T_1$

$T_2 = 0.987\,(348.66\ NW)$

$\boxed{T_2 = 344.72\ NW}$



$T_1x = T_1 \cos 180°$

$T_1x = -600\,N \cos 180°$

$T_1x = -600\,NW$

$T_1y = 600\,NW \operatorname{sen} 180°$

$T_1y = 0$

$T_2x = T_2 \cos 40°$

$T_2x = 0.766\ T_2$

$T_2y = T_2 \operatorname{sen} 40°$

$T_2y = 0.642\ T_2$

$\Sigma Tx = 0$

$T_1x + T_2x = 0$

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

$T_2 = \frac{600\,NW}{0.766}$

$T_2 = 783.28\,NW$

$\Sigma Ty = 0$

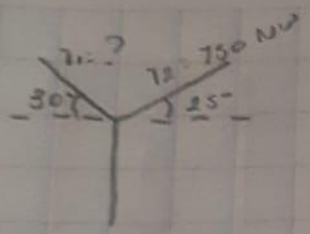
$T_1y + T_2y - w = 0$

$0.642\ T_2 - w =$

$0.642(783.28)$

$502.86\,NW = w$

⑦ ~~⑭~~ 25 NOV 21



$T_{1x} = T_1 \cos 150°$

$T_{1x} = -0.866$

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

$T_{1y} = 0.5$

$T_{2x} = T_2\ 750\ Nw \cos 25°$

$T_{2x} = 135.91$

$T_{2y} = T_2\ 750\ Nw \operatorname{sen} 25°$

$T_{2y} = 63.39$

$\Sigma T_x = 0$

$-0.866 t_1 + 735.946\ Nw = 0$

$T_1 = \frac{735.946}{0.866}$

$T_1 = 158.981$

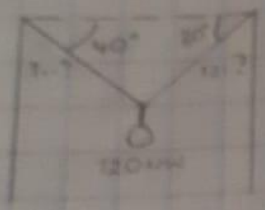
$T_{1y} + T_{2y} = 0$

$0.5\,(156.981) + 63.39 = 0$

$78.49 + 63.39 = w$

$w = 141.88$

(8)



$T_{1x} = T_1 \cos 140°$

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

$T_{1y} = T_1 \operatorname{sen} 110°$

$T_{1y} = 0.642\ T_1$

$T_{2x} = T_2 \cos 60°$

$T_{2x} = 0.5$

$T_{2y} = 0.866$

$\Sigma T_x = 0$

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

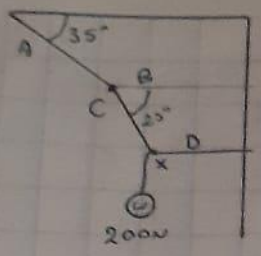
$-0.766 T_1 + 0.866 T_2 = 0$

$\Sigma T_y = 0$

$0.642 T_1 + 0.5 T_2 = 1200\ N$

30/noviembre/21

⑨



*Nota: empezar primero desde abajo.

$C_x = C \cos 175$ (175 = 25 + 90 = 175)

$C_x = -0.422\,C$

$C_y = C \operatorname{sen} 175$

$C_y = 0.906\,C$

$D_x = D \cos 0$

$D_x = D$

$D_y = D \operatorname{sen} 0$

$D_y = 0$

$\Sigma x = 0$

$C_x + D_x = 0$

$-0.422\,C + D = 0$

$D = 0.422\,C$

$\Sigma y = 0$

$C_y + D_y = W$

$0.906\,C = 200\,N$

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

$C = 220.75\,N$

$D = 0.422\,C$

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

$D = 93.15\,N$

$A_x = A \cos 195°$

$+ A_x = -0.819\,N$

$A_y = A \operatorname{sen} 195°$

$A_y = 0.573\,A$

$B_x = B \cos 0°$

$+ B_x = B$

$B_y = 0$

$C_x = 220.7 \cos 335°$

$+ C = 200.02\,N$

$C_y = 220.7 \operatorname{sen} 335°$

$C_y = -93.27\,N$

$\Sigma x = 0$

$A_x + B_x + C_x = 0$

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

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

$\Sigma y = 0$

$A_y + B_y + C_y = 0$

$0.573\,A - 93.27\,N$

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

$A = 162.77\,N$

$-0.819\,(162.77\,N)$

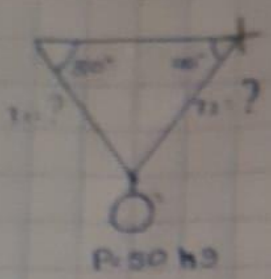
$+ B = 200.02\,N$

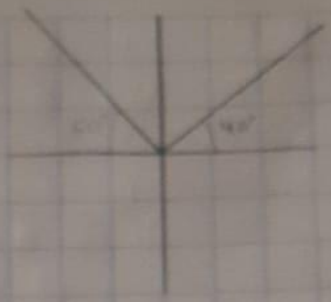
$-133.30 + B = 200.02$

$B = 200.02 + 133.30$

$B = 333.32\,N$

(10)





$T_{1X} = T_1 \cos 130°$

$T_{1X} = -0.642\,T_1$

$T_{1Y} = T_1 \operatorname{sen} 130°$

$T_{1Y} = 0.766\,T_1$

$T_{2X} = T_2 \cos 40°$

$T_{2X} = 0.765\,T_2$

$T_{2Y} = T_2 \operatorname{sen} 40°$

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

$\Sigma T_X = 0$

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

$-0.642\,T_1 + 0.765\,T_2 = 0$

$0.765 = 0.642$

$\Sigma T_Y = 0$

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

$0.766\,T_1 + 0.642\,T_2 - 50\ kg = 0$

$0.766\,T_1 + 0.642\,T_2 = 50\ kg$

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

$(0.642)(0.766\,T_1 + 0.642\,T_2 = 50\ kg)$

$-0.491 + 0.586 = 0$

$0.491 + 0.442 = 32.1 + kg$

$0.998 = 32.1\ kg$

$\frac{32.1\ kg}{0.998}$

$T_2 = 32.164$

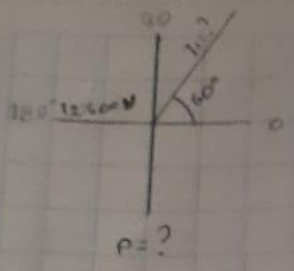
$-0.491 + 0.586\,(32.164 = 0$

$0.491 + 18.84 = 0$

$\frac{18.84}{0.491}$

$T_1 = 38.37$

(T1)



$T_{1x} = T_1 \cos 60°$

$T_{1x} = 0.5 T_1$

$T_{1y} = T_1 \text{ sen } 60°$

$T_{1y} = 0.86\ T_1$

$T_{2x} = T_2\ 600N \cos 180°$

$T_{2x} = 600 T_2$

$T_{2y} = T_2\ 600N \text{ sen } 180°$

$T_{2y} = 0 T_2$

$\Sigma T_x = 0$

$0.5 T_1 - 600 T_2 = 0$

$T_1 = \frac{600}{0.5}$

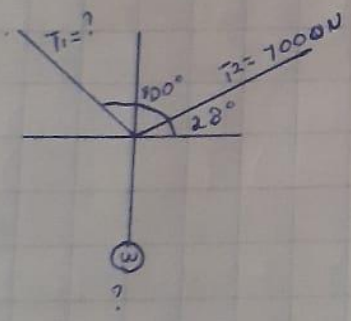
$T_1 = 1200$

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

$0.86\ (1200) =$

$1.032\ N$

(T2)



$T_{1x} = T_1 \cos 100°$

$T_{1x} = -0.17 T_1$

$T_{1y} = T_1 \text{ sen } 100°$

$T_{1y} = 0.984 T_1$

$T_2 x = T_2\ 1000 \cos 28°$

$T_{2x} = 882 T_2$

$T_{2y} = T_2\ 1000 \text{ sen } 28°$

$T_{2y} = 469.47$

$\Sigma T_x = 0$

$-0.17 T_1 + 882 = 0$

$882 = 0.173$

$T_1 = \frac{882}{-0.17}$

$T_1 = 5,188.23$

$\Sigma T_y = 0$

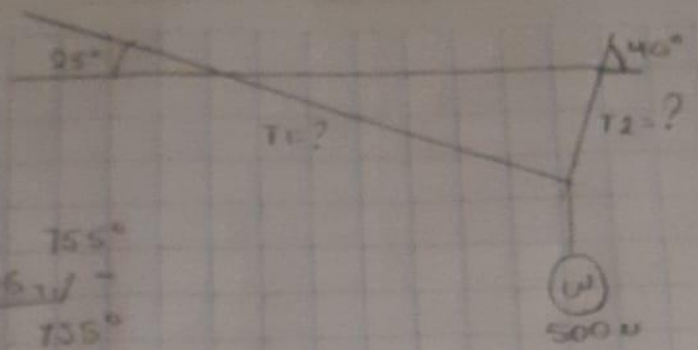
$T_{1y} + T_{2y} - W = 0$

$0.98 T_1 + 469.47 T_2 = W$

$0.98 T_1 (188.23 T_1) + 469.47 T_2 = W$

$5,553.93 = W$

13



$T_{1x} = T_1 \cos 125°$

$T_{1x} = -0.906 T_1$

$T_{1y} = T_1 \operatorname{sen} 125°$

$T_{1y} = 0.422 T_1$

$T_{2x} = T_2 \cos 40°$

$T_{2x} = 0.766 T_2$

$T_{2y} = T_2 \operatorname{sen} 40°$

$T_{2y} = 0.642 T_2$

$\Sigma T_x = 0$

$T_1 + T_2 = 0$

$-0.906 T_1 + 0.766 T_2 = 0$

$0.766 = 0.906$

$\Sigma T_y = 0$

$T_{2x} + T_{2y} = W$

$0.422 T_2 + 0.642 T_2 = W$

$T_1 \quad (0.422 T_1) - 0.906 T_1 + 0.766 T_2 = 0$

$(0.906 T_1) \quad 0.422 + 0.642 = 500 N$

$-0.382 T_1 + 0.693 T_2 = 0$

$0.382 T_1 + 0.581 T_2 = 453 N$

$-0.382 T_1 + 0.323 (605.61) = 0$

$0.382 T_1 + 195.23 = 0$

$T_1 = \frac{195.23}{0.382}$

$T_1 = 511.07 N$

$\frac{0.748}{}$

$T_2 = \frac{4.53 N}{0.748}$

$T_2 = 605.61 N$

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

$0.422 T_1 + 0.647 T_2 = 0$

$0.422 T_1 + 0.47 T_2 = 500 N$