



Mi Universidad

Problematario

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Equilibrio con fuerzas coplanares no paralelas y concurrentes

Parcial 3

Física

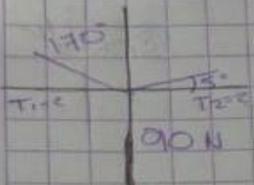
Juan José Ojeda Trujillo

Técnico en administración de recursos humanos

4to cuatrimestre

Problemas

1: Una pirata que pesa 900 N



$$\sum T_x = 0$$

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

$$0.98T_1 + 0.99T_2 = 0$$

$$\sum T_y = 0$$

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

$$0.17T_1 + 0.08T_2 = 900 \text{ N}$$

$$T_{1x} = T_1 \cos 170^\circ$$

$$T_{1x} = -0.98$$

$$T_{2x} = T_2 \cos 5^\circ$$

$$0.99$$

$$T_{1y} = T_1 \sin 170^\circ$$

$$T_{1y} = 0.17$$

$$T_{2y} = T_2 \sin 5^\circ$$

$$T_{2y} = 0.08$$

$$\begin{pmatrix} -0.98T_1 + 0.99T_2 = 0 \\ 0.17T_1 + 0.08T_2 = 900 \end{pmatrix} \begin{pmatrix} (0.17) \\ (0.98) \end{pmatrix}$$

$$-0.1666 + 0.1688 T_2 = 0$$

$$0.1666 + 0.0784 T_2 = 88.2$$

$$0.246 T_2 = 88.2$$

$$T_2 = \frac{88.2}{0.246}$$

$$T_2 = 358.5 \text{ N}$$

$$T_2 = 358.5 \text{ N}$$

$$-0.98T_1 + 0.99(358.5 \text{ N}) = 0$$

$$-0.98T_1 + 354.9 = 0$$

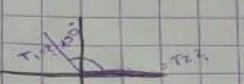
$$T_1 = \frac{-354.9}{-0.98}$$

$$T_1 = 362.1 \text{ N}$$

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KUT

Z: Un objeto de acero de 679.14 N .



$P = 679.14$

$T_{1x} = T_1 \cos 150^\circ$
 $T_{1x} = -0.86$

$T_{2x} = T_2 \cos 0$
 $T_{2x} = 1$

$T_{1y} = T_1 \sin 150^\circ$
 $T_{1y} = 0.5$

$T_{2y} = T_2 \sin 0^\circ$
 $T_{2y} = 0$

$\sum T_x = 0$
 $T_{1x} + T_{2x} = 0$
 $-0.86T_1 + 1T_2 = 0$

$\sum T_y = 0$
 $T_{1y} + T_{2y} = W$
 $0.5T_1 = 679.14 \text{ N}$
 $T_1 = \frac{679.14 \text{ N}}{0.5}$
 $T_1 = 1358.28$

$-0.86(1358.28) + 1T_2 = 0$
 $-1168.12 + 1T_2 = 0$
 $1T_2 = 1168.12$
 $T_2 = \frac{1168.12}{1}$
 $T_2 = 1168.12$

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3. Dos paredes están separadas a una distancia de 6m una de otra: un objeto cuyo peso es de 1200 N está en el centro de una cuerda, y forma ángulos de 40° y 30° respectivamente.

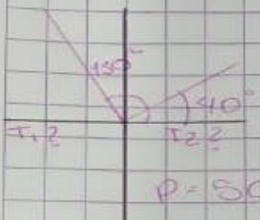
$P = 1200 \text{ N}$
 $T_{1x} = T_1 \cos 140^\circ$
 $T_{1x} = -0.76$
 $T_{2x} = T_2 \cos 30^\circ$
 $T_{2x} = 0.86$
 $T_{1y} = T_1 \sin 140^\circ$
 $T_{1y} = 0.86$
 $T_{2y} = T_2 \sin 30^\circ$
 $T_{2y} = 0.5$

$\sum T_x = 0$
 $T_{1x} + T_{2x} = 0$
 $-0.76 T_1 + 0.86 T_2 = 0$
 $\sum T_y = 0$
 $T_{1y} + T_{2y} = W$
 $0.64 T_1 + 0.5 T_2 = 1200 \text{ N}$
 $(-0.76 T_1 + 0.86 T_2 = 0) (0.64)$
 $(0.64 T_1 + 0.5 T_2 = 1200 \text{ N}) (0.36)$
 $0.48 T_1 + 0.55 T_2 = 0$
 $-0.48 T_1 + 0.38 T_2 = -912$
 $0.17 = -912$
 $T_2 = \frac{-912}{0.17} \quad T_2 = -53$
 $0.64 T_1 + 0.5(-5364.7) = 1200$
 $0.64 T_1 - 2682.35 = 1200$
 $0.64 T_1 - 2682.35 = 1200$
 $0.64 T_1 = 1200 + 2682.35$
 $T_1 = \frac{3882.35}{0.64}$
 $T_1 = 6066.17$

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4: se tiene una bola metálica de 50 kg, que esta suspendida de dos cuerdas.



$$\sum T_x = 0$$

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

$$-0.64T_1 + 0.76T_2 = 0$$

$$\sum T_y = 0$$

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

$$0.76T_1 + 0.64T_2 = 50 \text{ kg}$$

$$T_{1x} = T_1 \cos 130^\circ$$

$$T_{1x} = -0.64$$

$$T_{2x} = T_2 \cos 40^\circ$$

$$T_{2x} = 0.76$$

$$(-0.64T_1 + 0.76T_2 = 0) \cdot (0.76)$$

$$(0.76T_1 + 0.64T_2 = 50) \cdot (-0.64)$$

$$T_{1y} = T_1 \sin 130^\circ$$

$$T_{1y} = 0.76$$

$$T_{2y} = T_2 \sin 40^\circ$$

$$T_{2y} = 0.64$$

$$0.48T_1 + 0.57T_2 = 0$$

$$0.48T_1 + 0.40T_2 = -32$$

$$0.17 = -32$$

$$T_2 = \frac{-32}{0.17} = T_2 = -188.23$$

$$0.76T_1 + 0.64(-188.23) = 50 \text{ kg}$$

$$0.76T_1 + 120.46 = 50$$

$$0.76T_1 = 50 \text{ kg} + 120.46$$

$$T_1 = \frac{170.46}{0.76}$$

$$T_1 = 224.28$$