Uds. tiene el enunciado. Es importante escribir las unidades de medida. No las escribí por problema de tiempo.

1.- $\vec{F}_1 = \begin{bmatrix} 30\cos 40° & 30\sin 40° & 0 \end{bmatrix}$ $\vec{F}_2 = \begin{bmatrix} 40\cos 70° & -40\sin 70° & 0 \end{bmatrix}$

$m = 8$

$\vec{F}_1 + \vec{F}_2 = 8\vec{a} \to \vec{a} = \frac{1}{8}\left(\vec{F}_1 + \vec{F}_2\right)$

$\vec{a} = \frac{1}{8}\left(\vec{F}_1 + \vec{F}_2\right) = \begin{bmatrix} \frac{15}{4}\cos\frac{2}{9}\pi + 5\cos\frac{7}{18}\pi & \frac{15}{4}\sin\frac{2}{9}\pi - 5\sin\frac{7}{18}\pi & 0 \end{bmatrix}$

$\vec{a} = \begin{bmatrix} 4.5828 & -2.288 & 0.0 \end{bmatrix}$

....

2.- $\vec{F}_1 = \begin{bmatrix} F_1\cos 40° & F_1\sin 40° & 0 \end{bmatrix}$ $\vec{F}_2 = \begin{bmatrix} F_2\cos 70° & -F_2\sin 70° & 0 \end{bmatrix}$

$\vec{F}_1 + \vec{F}_2 = m\vec{a}$

$\begin{bmatrix} F_1\cos 40° & F_1\sin 40° & 0 \end{bmatrix} + \begin{bmatrix} F_2\cos 70° & -F_2\sin 70° & 0 \end{bmatrix} = 8\begin{bmatrix} 3 & 0 & 0 \end{bmatrix}$

$\begin{bmatrix} F_1\cos 40° + F_2\cos 70° & F_1\sin 40° - F_2\sin 70° & 0 \end{bmatrix} = \begin{bmatrix} 24 & 0 & 0 \end{bmatrix}$

$\begin{matrix} F_1\cos 40° + F_2\cos 70° = 24 \\ F_1\sin 40° - F_2\sin 70° = 0 \end{matrix}$, Solution is: $\{[F_2 = 16.417, F_1 = 24.0]\}$

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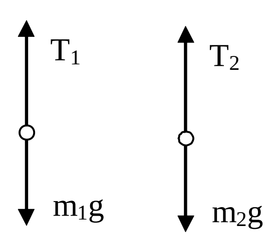
4.- Solution is: $\{[a = 3.3333, T_2 = 66.667, m_2 = 10.0, T_1 = 66.667]\}$

OBS:

para	se considera que el eje positivo es
la masa 1	hacia arriba
la masa 2	hacia abajo

$$\begin{gathered} T_1 - m_1 g = m_1 a \\ m_2 g - T_2 = m_2 a \\ T_1 = T_2 \\ m_1 = 5 \\ g = 10 \\ m_2 = 2m_1 \end{gathered}$$



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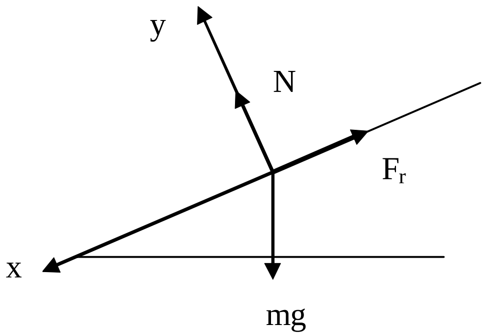
5.- Solution is: $\{[a = 2.4019, F_r = 25.981, N = 86.603]\}$



$$mg\sin 30° - F_r = ma$$
$$N - mg\cos 30° = 0$$
$$F_r = \mu N$$
$$\mu = 0.3$$
$$g = 10$$
$$m = 10$$

....

6.-

$$T - F_r = m_1 a$$
$$N - m_1 g = 0$$
$$F_r = \mu N$$
$$m_2 g - T = m_2 a$$
$$\mu = 0.25$$
$$g = 10$$
$$m_1 = 2$$
$$m_1 = 2 \cdot m_2$$

, Solution is: $\{[N = 20.0, F_r = 5.0, a = 1.6667, m_2 = 1.0, T = 8.3333]\}$

....

7.-

$T + m_1 g - F_r - F\cos\varphi = 0$						$m_2 g + m_1 g - \mu F\sin\varphi - F\cos\varphi = 0$
$F\sin\varphi - N = 0$	$\rightarrow$	$N = F\sin\varphi$	$\searrow$		$\nearrow$	$\downarrow$
$F_r = \mu N$	$\rightarrow$	$\rightarrow$	$\rightarrow$	$F_r = \mu F\sin\varphi$		$\mu = \frac{m_2 g - F\cos\varphi + g m_1}{F\sin\varphi}$
$m_2 g - T = 0$	$\rightarrow$	$T = m_2 g$				

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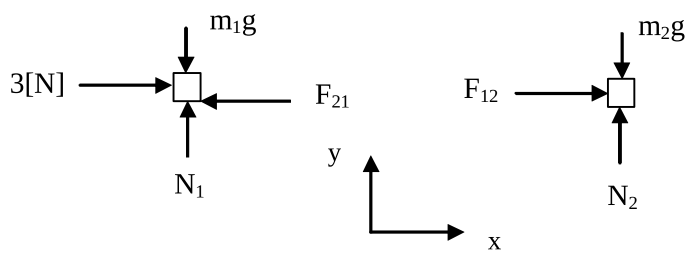
8.- La fuerza de roce no aparce enlos DCL, debido a que las superficies se han considerado sin fricción

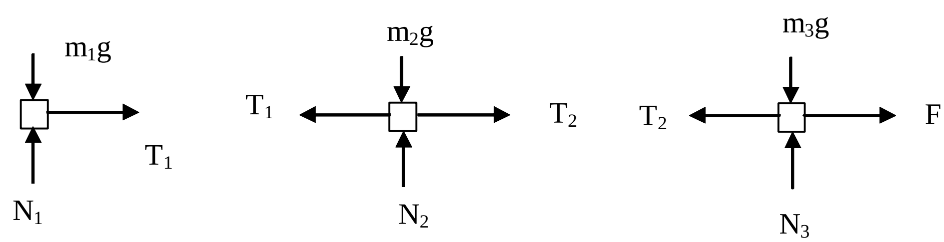


$$3 - F_{21} = 2a$$
$$F_{12} = 1 \cdot a$$
, Solution is: $\{[F = 1.0, a = 1.0]\}$

....

9.-

$F = 60$
$m_1 = 10$
$m_2 = 20$
$m_3 = 30$



$$T_1 = m_1 a$$
$$T_2 - T_1 = m_2 a$$
$$F - T_2 = m_3 a$$
, Solution is: $\{[T_1 = 10.0, T_2 = 30.0, a = 1.0]\}$

....

11.- A partir de: $-F_r = ma \to -\mu mg = ma \to a = -6.86\left[\frac{m}{s^2}\right]$

y de $2ad = v_f^2 - v_0^2 \to v_0 \approx 24.847[\frac{m}{s}] \approx 89.45\left[\frac{km}{h}\right]$

....

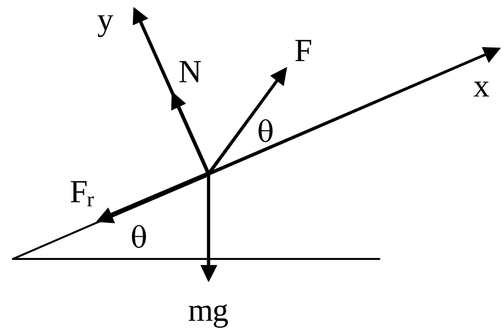
12.-
$$10\cos 36.87° - 5\cos 53.13° = 10a$$
$$10\sin 36.87° + N - 10\sin 53.13° = 0$$
, Solution is: $\{[a = 0.5, N = 2.0]\}$

Observación: se cambió el valor de la masa a $1[kg]$,y se tomó $g = 10\left[\frac{m}{s^2}\right]$

....

13.-

$$250\cos\theta - mg\sin\theta - 8 = 20a$$
$$N + 250\sin\theta - mg\cos\theta = 0$$
$$F_r = \mu N$$
$$\theta = 37°$$
$$F_r = 8$$
$$g = 9.8$$
$$m = 20$$



15.- $T - F_r = ma$, $N - 50 = 0$, $F_r = \mu N$, $F = 10$, $T = F$, Solution is: $\{[a = 0.1, N = 50.0, \mu = 0.16]\}$

16.- $T - mg\cos 53° - F_r = ma$, $N - mg\sin 53° = 0$, $F_r = \mu N$, $a = 1$, $m = 80$, $\mu = 0.125$, $g = 9.8$, Solution is: $\{[T = 630.09, F_r = 78.266, N = 626.13]\}$

30.-

eje y $Mg - T = 0$

$F_r = \mu N$

eje x $T - F_r = 0$

eje y $N - mg = 0$

$$\rightarrow \begin{matrix} Mg - T = 0 \\ T = F_r \\ F_r = \mu N \\ N = mg \end{matrix} \rightarrow \begin{matrix} Mg = T \\ T = F_r \\ F_r = \mu mg \end{matrix} \rightarrow \begin{matrix} Mg = F_r \\ F_r = \mu mg \end{matrix} \rightarrow Mg = \mu mg \rightarrow \mu = \frac{M}{m}$$