1. a. $\Theta = \cos^{-1}\left(\dfrac{\vec{F_1} \cdot \vec{F_2}}{\|\vec{F_1}\| \, \|\vec{F_2}\|}\right) = \cos^{-1}\left(\dfrac{100 + 8}{\sqrt{101}\, \sqrt{108}}\right) = \boxed{27.98°}$

b. $\Theta = \cos^{-1}\left(\dfrac{\vec{F_3} \cdot \vec{F_4}}{\|\vec{F_3}\| \, \|\vec{F_4}\|}\right) = \cos^{-1}\left(\dfrac{27 + 117}{\sqrt{250}\, \sqrt{90}}\right) = 16.26°$

a im between f_1 and f_2 b/c the angle is wider.

2. • no, cannot multiply T by $\vec{\ell}$ b/c the number of columns in T does not equal the number of rows in $\vec{\ell}$.

• $T^T = \begin{bmatrix} 1 & 1 & 1 \\ 28 & 94 & 72 \end{bmatrix}$ $T^T \vec{\ell} = \begin{bmatrix} (130 + 285 + 600) \\ (28 \cdot 130 + 94 \cdot 285 + 72 \cdot 600) \end{bmatrix}$

$= \boxed{\begin{bmatrix} 10\ 15 \\ 73630 \end{bmatrix}}$

• the first element shows how many likes these 3 videos have in total (in thousands).

3. a. no, it is not a matrix b/c it stores values like names and links (which are not numbers).