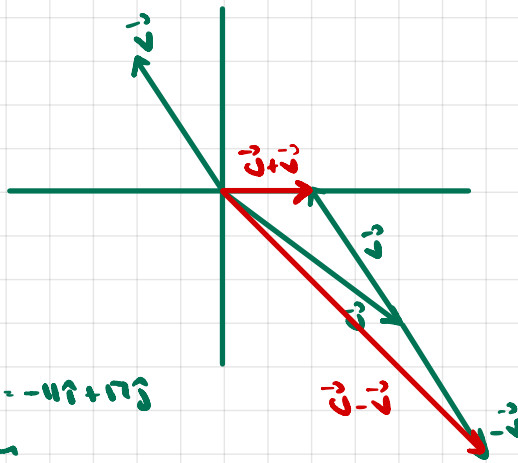


Ex 3  $\vec{u} = \langle 4, -3 \rangle$   
 $\vec{v} = \langle -2, 3 \rangle$

$$|\vec{u}| = \sqrt{16+9} = 5$$

$$\vec{u} + \vec{v} = \langle 2, 0 \rangle$$



Ex 5  $\vec{a} = 8\hat{i} + 5\hat{j}$   $\vec{b} = -11\hat{i} + 17\hat{j}$

$$|\vec{a}| = \sqrt{64+25} = \sqrt{89}$$

$$|\vec{b}| = \sqrt{121+289} = \sqrt{410}$$

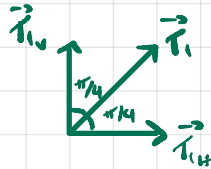
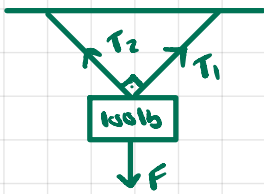
$$\vec{a} - \vec{b} = 19\hat{i} - 12\hat{j}$$

$$|\vec{a} - \vec{b}| = 505$$

if  $\triangle$

$$|\vec{a} + \vec{b}|^2 = |\vec{a}|^2 + |\vec{b}|^2 \Rightarrow 505 = 89 + 410 \Rightarrow 505 = 499 \times \text{FALSE}$$

Ex 6



$$\vec{T}_1 = |\vec{T}_{1H}| \hat{i} + |\vec{T}_{1V}| \hat{j}$$

$$|\vec{T}_{1H}| = |\vec{T}_1| \cos \pi/4 = |\vec{T}_{1V}|$$

$$= |\vec{T}_1| \cos \frac{\pi}{4} \hat{i} + |\vec{T}_1| \cos \frac{\pi}{4} \hat{j}$$

$$\vec{T}_2 = -|\vec{T}_2| \cos \frac{\pi}{4} \hat{i} + |\vec{T}_2| \cos \frac{\pi}{4} \hat{j}$$

$$\vec{F} = -100 \hat{j}$$

$$\vec{T}_1 + \vec{T}_2 + \vec{F} = 0 \Rightarrow \hat{i} [|\vec{T}_1| \cos \frac{\pi}{4} - |\vec{T}_2| \cos \frac{\pi}{4}] + \hat{j} [|\vec{T}_1| \cos \frac{\pi}{4} + |\vec{T}_2| \cos \frac{\pi}{4} - 100] = \langle 0, 0 \rangle$$

$$\Rightarrow |\vec{T}_1| = |\vec{T}_2| = T$$

$$2T \cos \frac{\pi}{4} = 100 \Rightarrow T = 50 \cdot \frac{2}{\sqrt{2}} = 50\sqrt{2}$$

