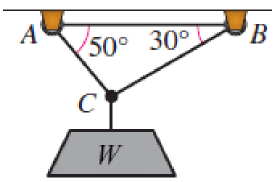
2. 0/2 points LarTrig10 3

Use the figure to determine the tension in each cable supporting the load. (Round your answers to one dec

W = 2023 lb

tension in $\overline{AC}$ [ ] 1779.0 lb

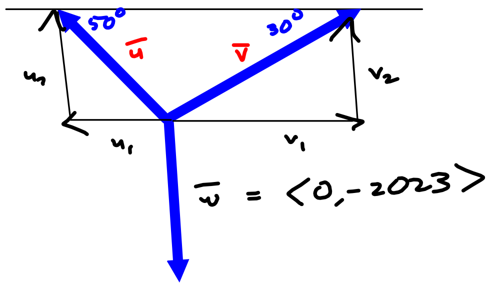
tension in $\overline{BC}$ [ ] 1320.4 lb



Need Help? Read It Watch It

$\bar{u} = \langle u_1, u_2 \rangle$

$\bar{v} = \langle v_1, v_2 \rangle$



$\bar{w} = \langle 0, -2023 \rangle$

$u_2 + v_2 = 2023$

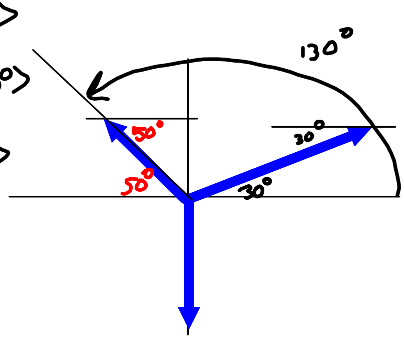
$u_1 + u_2 = 0$

$\bar{u} + \bar{v} = \langle 0, 2023 \rangle$

$\bar{u} = \langle \|\bar{u}\| \cos 130°, \|\bar{u}\| \sin 130° \rangle$

$= \|\bar{u}\| \langle \cos 130°, \sin 130° \rangle$

$\bar{v} = \|\bar{v}\| \langle \cos 30°, \sin 30° \rangle$



Now:

$u_1 + v_1 = 0$

$\|\bar{u}\| \cos 130° + \|\bar{v}\| \cos 30° = 0$

$x \cos 130° + y \cos 30° = 0$

$\cos(130°)x + \cos(30°)y = 0$

where $\boxed{x = \|\bar{u}\| \ \& \ y = \|\bar{v}\|, \quad a = \cos 130°, \quad b = \cos 30°}$

$ax + by = 0$

$u_2 + v_2 = 2023$

$\|\bar{u}\| \sin 130° + \|\bar{v}\| \sin 30° = 2023$

$cx + dy = 2030,$

where $\boxed{c = \sin 130°, \ d = \sin 30°}$

$ax + by = 0$

$cx + dy = 2023$

$ax = -by$

$x = -\frac{by}{a}$

$c\left(-\frac{by}{a}\right) + dy = 2023$

$-\frac{bcy}{a} + dy = 2023$

$y\left(-\frac{bc}{a} + d\right) = 2023$

```
2023/(-cos(30)*sin(130)/cos(130)
+sin(30))
                    1320.419473
Ans*-cos(30)/cos
(130)
                    1778.996344
```

$$y = \frac{2023}{-\frac{bc}{a} + d}$$

$$= \frac{2023}{\left(-\frac{(\cos 30^\circ)(\sin 130^\circ)}{\cos 130^\circ} + \sin 30^\circ\right)}$$

$$\approx \boxed{1320.419473 \text{ lbs} \approx y}$$

$$\Rightarrow x = -\frac{by}{a} = -\frac{\cos(30^\circ)(1320.\ldots)}{\cos(130^\circ)}$$

$$\approx \boxed{1778.996344 \text{ lbs} \approx x}$$

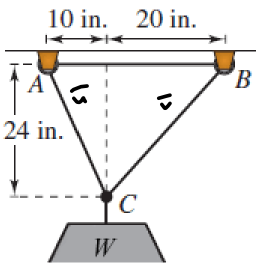
3. 0/2 points LarTrig10 3.3.086. [38832

Use the figure to determine the tension in each cable supporting the load. (Round your answers to one decimal point.)

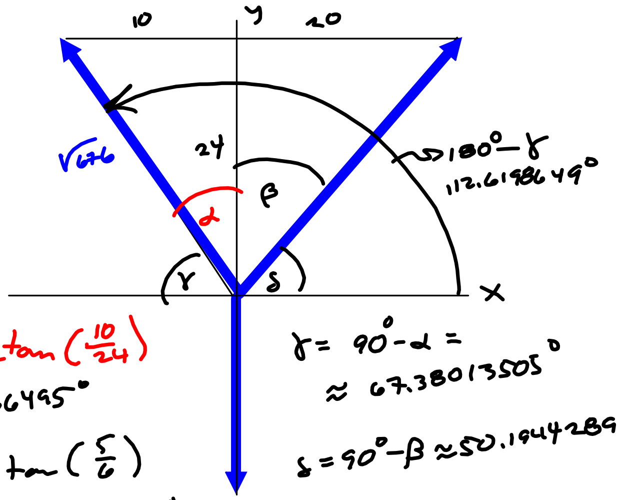
W = 5100 lb

tension in $\overline{AC}$ 3683.3 lb

tension in $\overline{BC}$ 2212.9 lb



$\bar{u} + \bar{v} = \langle 0, -5100 \rangle$



676

```
         1778.996344
24²-100
                 476
tan⁻¹(5/12)
         22.61986495
tan⁻¹(5/6
         39.80557109
```

$\alpha = \arctan\left(\frac{10}{24}\right)$

$\approx 22.61986495^\circ$

$\gamma = 90^\circ - \alpha =$

$\approx 67.38013505^\circ$

$\beta = \arctan\left(\frac{5}{6}\right)$

$\approx 39.80557109^\circ$

$\delta = 90^\circ - \beta \approx 50.19442891^\circ$

we need

$\bar{u} + \bar{v} = \langle 0, 5100 \rangle$

$\bar{u} = \|\bar{u}\| \langle \cos 122...^\circ, \sin 122...^\circ \rangle$

$\bar{v} = \|\bar{v}\| \langle \cos 50....^\circ, \sin 50....^\circ \rangle$

$(\cos 122...^\circ)\|\bar{u}\| + \cos(50...)\|\bar{v}\| = 0$

$(\sin 122...^\circ)\|\bar{u}\| + \sin(50...^\circ)\|\bar{v}\| = 5100$

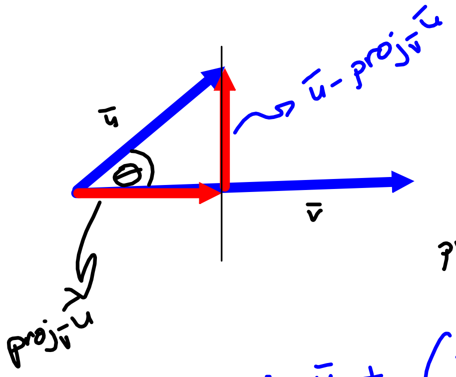
$\cos a + \cos b = 0$

$\sin a + \sin b = 5100$

$$\left[\begin{array}{cc|c} \cos a & \cos b & 0 \\ \sin a & \sin b & 5100 \end{array}\right]$$

```
rref([A])
[[1 0 3424.7933...
 [0 1 2883.8234...
```

$$\begin{bmatrix} 1. & 0. & 3683.33333412984 \\ 0. & 1. & 2212.90407280603 \end{bmatrix}$$



$$\frac{\|proj_{\bar v}\bar u\|}{\|\bar u\|} = \cos\theta$$

$$proj_{\bar v}\bar u =$$

$$\|proj_{\bar v}\bar u\| = \|\bar u\|\cos\theta$$

$$proj_{\bar v}\bar u = \|proj_{\bar v}\bar u\|\frac{\bar v}{\|\bar v\|}$$

$$= \left(\|\bar u\|\cos\theta\right)\frac{\bar v}{\|\bar v\|}$$

$$\bar u = proj_{\bar v}\bar u + \left(\bar u - proj_{\bar v}\bar u\right)$$

These are perpendicular

$$= \left(\|\bar u\|\frac{\bar u\cdot\bar v}{\|\bar u\|\|\bar v\|}\right)\frac{\bar v}{\|\bar v\|}$$

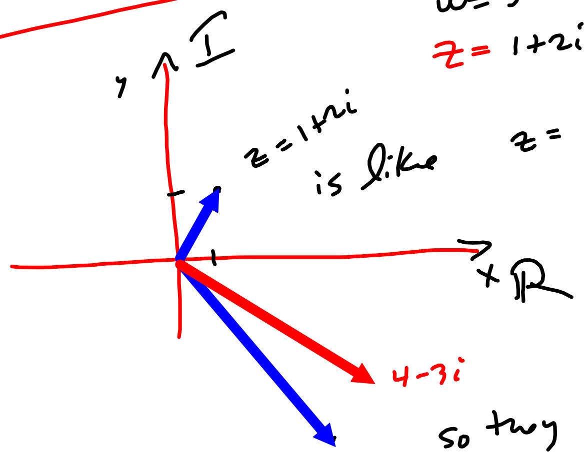
$$\boxed{proj_{\bar v}\bar u = \frac{\bar u\cdot\bar v}{\|\bar v\|^2}\bar v}$$

GRAM-SCHMIDT ORTHOGONALIZATION

Read & Stan!
on the Complex #s stuff

$w = 3-5i$ $\quad$ $z+w = 4-3i$

$z = 1+2i$



$z = 1+2i$ is like $\quad z = \langle 1, 2 \rangle$

so they add like vectors!