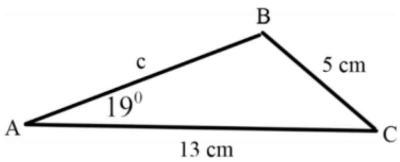
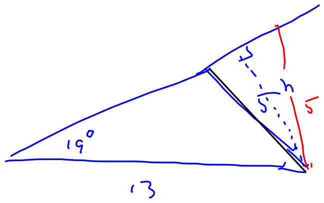
1. Consider the triangle in the figure. Do not use rounded results in your calculations for new results. Only round in the final answer to each of the following:



   a. (10 pts) This triangle is oriented a bit differently than others you've seen for this SSA situation. But you can still show there are 2 solutions to this triangle. Do so.

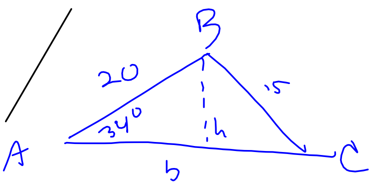


$\frac{h}{13} = \sin 19^0$

$h = 13 \sin 19^0 \approx 4.23 < 5 < 13$

$h < a < b$

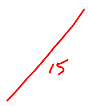
I gave you on Fall '19 test

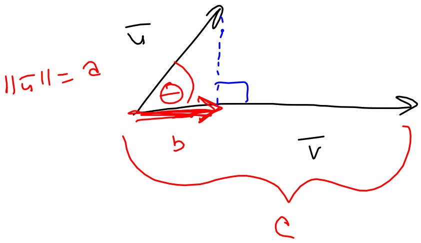


$h < a < c$

$\frac{h}{20} = \sin 34^0 \Longrightarrow h = 20 \sin 34^0 \approx 11.18$

< 15





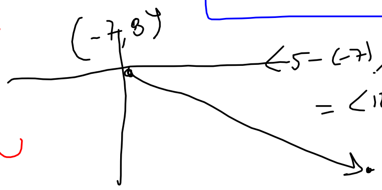
$\Rightarrow$ is $\text{proj}_{\bar{v}}\bar{u}$

$b = a\cos\theta$

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

$\theta = ?$ $\quad \cos\theta = \dfrac{b}{a}$

$$\boxed{\begin{array}{l} \cos\theta = \dfrac{\bar{u}\cdot\bar{v}}{\|\bar{u}\|\|\bar{v}\|} \\[2ex] \text{proj}_{\bar{v}}\bar{u} = \dfrac{\bar{u}\cdot\bar{v}}{\|\bar{v}\|^2}\,\bar{v} \end{array}}$$



$\langle 5-(-7), 1-8\rangle$

$= \langle 12, -7\rangle$

31) $\bar{u} = \langle 5,3\rangle$, $\bar{v} = \langle 2,7\rangle$

a. $\cos\theta = \dfrac{\bar{u}\cdot\bar{v}}{\|\bar{u}\|\|\bar{v}\|} = \dfrac{5\cdot 2 + 3\cdot 7}{\sqrt{5^2+3^2}\sqrt{2^2+7^2}} = \dfrac{31}{\sqrt{34}\sqrt{53}}$

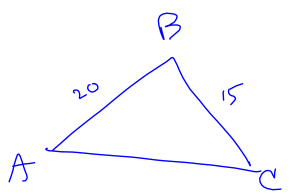
$\Rightarrow \theta = \cos^{-1}\left(\dfrac{31}{\sqrt{34}\sqrt{53}}\right)$

31 / (√(34)*√(53))

$\cos^{-1}(\text{previous}) \approx$ 43.09084757°

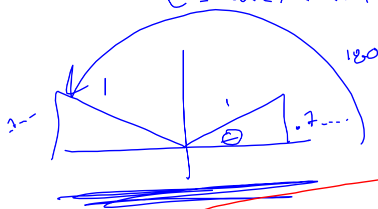
b. $\text{Proj}_{\bar{v}}\bar{u} = \dfrac{31}{53}\langle 2,7\rangle$ is Perfect!

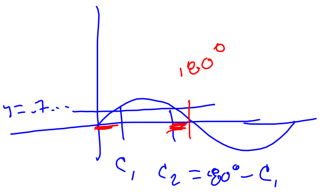
$= \dfrac{\bar{u}\cdot\bar{v}}{\|\bar{v}\|^2}\cdot\bar{v}$



#1e on test3 $\sin C = \frac{20 \sin 34^\circ}{15} \approx (.7\ldots)$

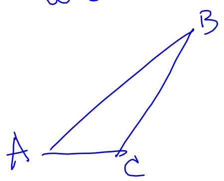
$\Rightarrow C = \arcsin(.7\ldots)$



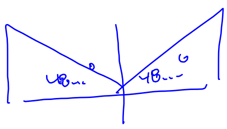


$\boxed{\frac{\sin C}{c} = \frac{\sin A}{a} \text{ holds}}$

whether C is acute or obtuse.

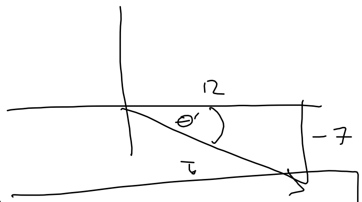


$C = 48\ldots^\circ$

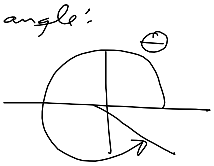


Direction Angle

$\langle 12, -7 \rangle$



Direction angle: θ



$\boxed{\arctan\left(\frac{-7}{12}\right) + 360^\circ}$ EXACT

$360^\circ - 30\ldots^\circ = \boxed{329\ldots^\circ}$

Extracting Square Roots

13.4.125

2 | 344500
2 | 172250
5 | 86125
5 | 17225
5 | 3645
729