

Questions?  $\|v\| = 9$  in direction of  
 970-290-0550  $\langle 1, 7 \rangle$

Call me if you have questions.

$$\|c\langle 1, 7 \rangle\| = 9$$

$$c\langle 1, 7 \rangle = \langle c, 7c \rangle$$

$$\sqrt{c^2 + (7c)^2} = \sqrt{c^2 + 49c^2} = \sqrt{50c^2} = 5c\sqrt{2} = 9$$

$$c = \frac{9}{5\sqrt{2}}$$

$$\frac{9}{5\sqrt{2}} \langle 1, 7 \rangle = \left\langle \frac{9}{5\sqrt{2}}, \frac{63}{5\sqrt{2}} \right\rangle$$

$$= \left\langle \frac{9\sqrt{2}}{10}, \frac{63\sqrt{2}}{10} \right\rangle$$

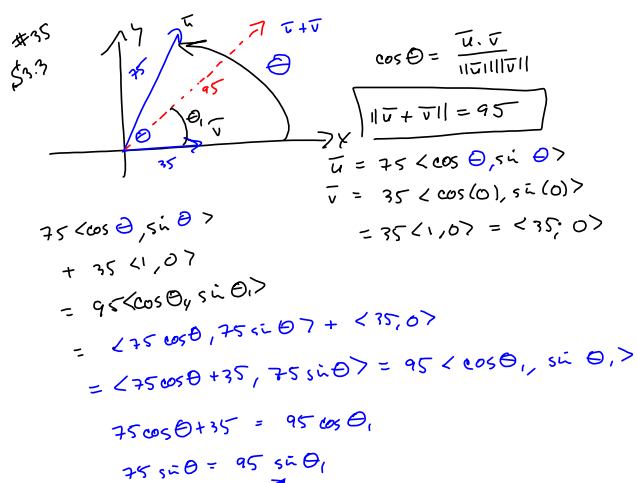
Another way of working it:

$\theta = \arctan(7)$

$$9 \langle \cos(\arctan(7)), \sin(\arctan(7)) \rangle$$

$$= 9 \left\langle \frac{1}{5\sqrt{2}}, \frac{7}{5\sqrt{2}} \right\rangle$$

$$\sqrt{\cos^2(\theta) + \sin^2(\theta)} = 1$$



$$\cos \theta = \frac{\vec{u} \cdot \vec{v}}{\|\vec{u}\| \|\vec{v}\|} = \frac{\vec{u} \cdot \vec{v}}{75 \cdot 35}$$

$$\begin{aligned} & \|\langle 75 \cos \theta + 35, 75 \sin \theta \rangle\| \\ &= \sqrt{(75 \cos \theta + 35)^2 + 75^2 \sin^2 \theta} = 95 \\ &= \sqrt{75^2 \cos^2 \theta + 2 \cdot 75 \cos \theta \cdot 35 + 35^2 + 75^2 \sin^2 \theta} \\ &= \sqrt{75^2 + (150)(35) \cos \theta + 35^2} = 95 \end{aligned}$$

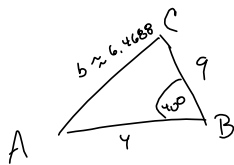
$$\Rightarrow 75^2 + (150)(35) \cos \theta + 35^2 = 95^2$$

$$(150)(35) \cos \theta = 95^2 - 35^2 - 75^2$$

$$\cos \theta = \frac{95^2 - 35^2 - 75^2}{(150)(35)} \approx .4142857143$$

$$\Rightarrow \theta \approx 65.52565744^\circ$$

$9.8 \cdot 19.10^{(1/3)}$
$26.19613369$
$(95^2 - 35^2 - 75^2) / (35 \cdot 150)$
$.4142857143$
$\cos^{-1}(\text{Ans})$
$65.52565744$



$a = 9$   
 $c = 4$   
 $B = 40^\circ$

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cos^-1(Ans)
65.52565744
97-72cos(40)
41.8448001
Ans^5
6.468755684
    
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$b^2 = a^2 + c^2 - 2ac \cos B$   
 $= 9^2 + 4^2 - 2(9)(4) \cos 40^\circ$   
 $= 81 + 16 - 72 \cos 40^\circ$   
 $= 97 - 72 \cos 40^\circ \approx 41.8448001$

$b \approx 6.468755684$

$\frac{\sin A}{a} = \frac{\sin B}{b} \Rightarrow \sin A = \frac{a \sin B}{b} \approx \frac{9 \sin 40^\circ}{6.468...} \approx .89431$

$\Rightarrow A \approx 63.42024721^\circ$

$180^\circ - 40^\circ - 63.42024721^\circ$

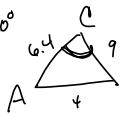
$\approx 76.57975279^\circ \approx C$

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41.8448001
Ans^5
6.468755684
9sin(40)/Ans
8943124103
sin^-1(Ans)
63.42024721
    
```

$A \approx 63.420247^\circ$

$B = 40^\circ$



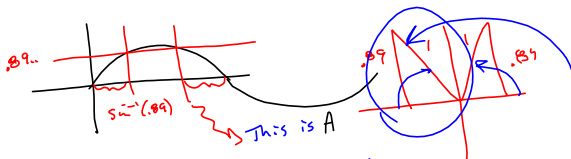
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6.468755684
9sin(40)/Ans
8943124103
sin^-1(Ans)
63.42024721
180-40-Ans
76.57975279
    
```

$a = 9 > 4 = c$   
 But  $A \approx 63^\circ < 76.6^\circ \approx C$ !

∅ A is longest side! Impossible.  
 Use Law of Sines to get ACUTE angle C.

$\sin A \approx .89$



So  $A = 180^\circ - \sin^{-1}(.89...)$