$\cos(u-v)$ $\cot u = -\frac{7}{8}$ $\frac{3\pi}{2} < u < 2\pi$, $\sec v = \frac{3}{1}$ $0 < v < \frac{\pi}{2}$

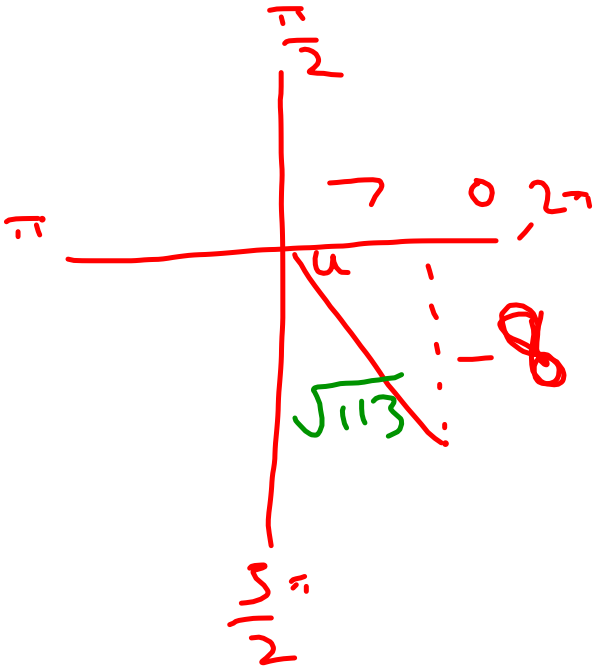
$\cos u \cos v + \sin u \sin v$

$\left(\frac{7}{\sqrt{113}}\right)\left(\frac{1}{3}\right) + \left(\frac{-8}{\sqrt{113}}\right)\left(\frac{2\sqrt{2}}{3}\right)$

$\frac{7}{3\sqrt{113}} + \frac{-16\sqrt{2}}{3\sqrt{113}}$

$\frac{7-16\sqrt{2}}{3\sqrt{113}} \cdot \frac{\sqrt{113}}{\sqrt{113}}$ $\frac{7\sqrt{113}-16\sqrt{226}}{339}$

u



$a^2 + b^2 = c^2$

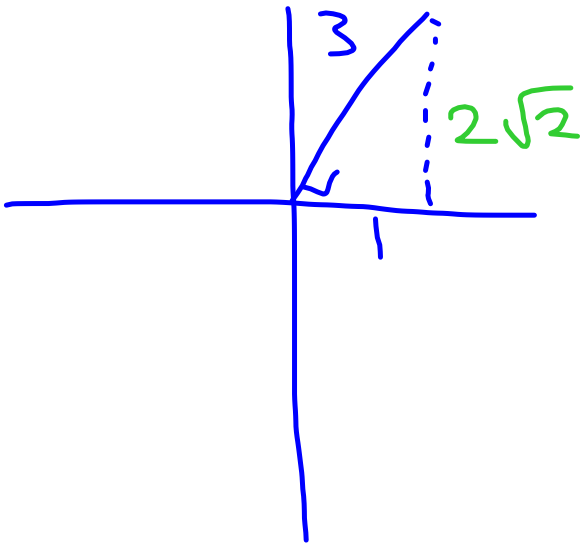
$(7)^2 + (-8)^2 = c^2$

$49 + 64$

$\sqrt{113} = \sqrt{c^2}$

$c = \sqrt{113}$

v



$a^2 + b^2 = c^2$

$1^2 + b^2 = 3^2$

$1 + b^2 = 9$

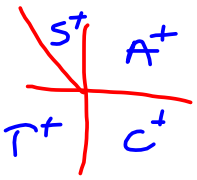
$-1 \quad -1$

$\sqrt{b^2} = \sqrt{8}$

$b = 2\sqrt{2}$

$\sin\theta = -\frac{30}{16+}$, $270^\circ < \theta < 360^\circ$, $135^\circ < \frac{\theta}{2} < 180^\circ$

Find $\cos\frac{\theta}{2} = \pm\sqrt{\frac{1+\cos\theta}{2}}$



$= \pm\sqrt{\frac{1+\frac{\sqrt{247}}{16}}{2}}$

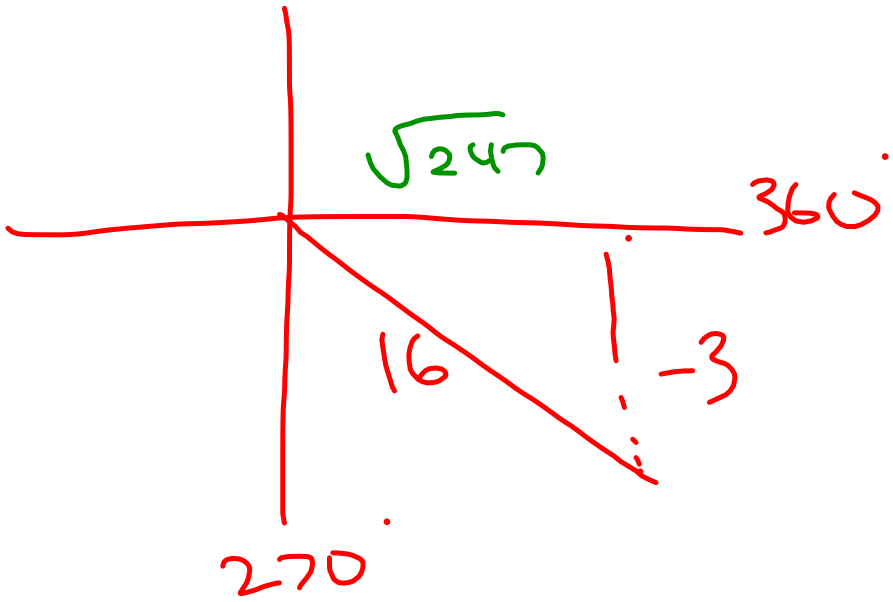
$= \pm\sqrt{\frac{\frac{16}{16}+\frac{\sqrt{247}}{16}}{2}}$

$= \pm\sqrt{\frac{\frac{16+\sqrt{247}}{16}\cdot\frac{1}{2}}{\left(\frac{2}{1}\right)}}$

$= \pm\sqrt{\frac{16+\sqrt{247}}{32}}$

$= \pm\sqrt{\frac{16+\sqrt{247}}{32}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$

$= \pm\frac{\sqrt{16\sqrt{2}+\sqrt{494}}}{8}$



$$a^2 + b^2 = c^2$$

$$(-3)^2 + b^2 = 16$$

$$9 + b^2 = 256$$

$$-9 \qquad -9$$

$$\sqrt{b^2} = \sqrt{247}$$

$$b = \sqrt{247}$$

$\cos u = \frac{-7}{25}$ H $\quad 90° < u < 180°$ II

$\tan v = \frac{-24}{10}$ A $\quad 270° < v < 360°$

$135 < \frac{v}{2} < 180$

$\frac{270°}{2} < \frac{v}{2} < \frac{360°}{2}$

---

(1) Find $\cos(u - v)$

$= \cos u \cos v + \sin u \sin v$

$\left(\frac{-7}{25}\right)\left(\frac{10}{26}\right) + \left(\frac{24}{25}\right)\left(\frac{-24}{26}\right)$

$= \frac{-323}{325}$

(2) Find $\sin \frac{v}{2}$

other 2

$$\sin 2u = 2\sin u \cos u$$

$$= 2\left(\frac{24}{25}\right)\left(\frac{-7}{25}\right)$$

$$= \frac{-336}{625}$$

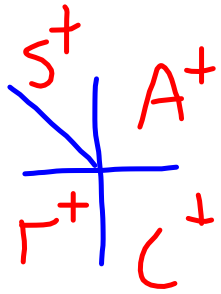
(2) $\sin\frac{v}{2} = \pm\sqrt{\frac{1-\cos v}{2}}$

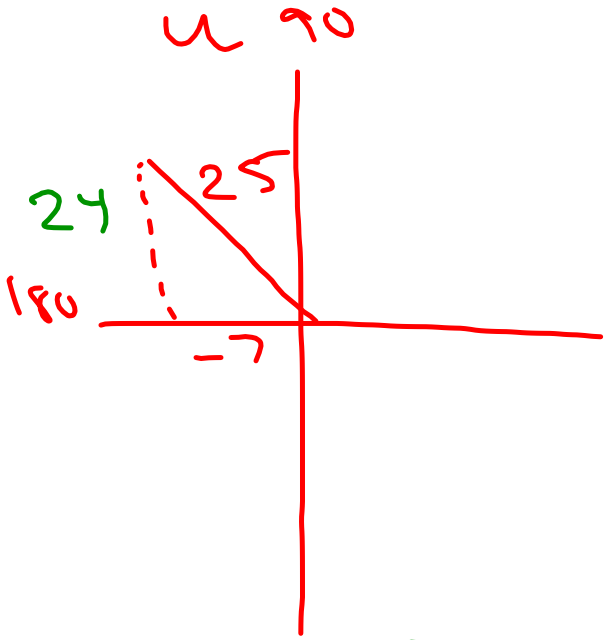
$= \pm\sqrt{\frac{1-\frac{10}{26}}{2}}$

$= \pm\sqrt{\frac{4}{13}}$

$= \pm\frac{\sqrt{4}}{\sqrt{13}} = \pm\frac{2}{\sqrt{13}}\cdot\frac{\sqrt{13}}{\sqrt{13}}$

$= \pm\frac{2\sqrt{13}}{13}$





$a^2+b^2=c^2$

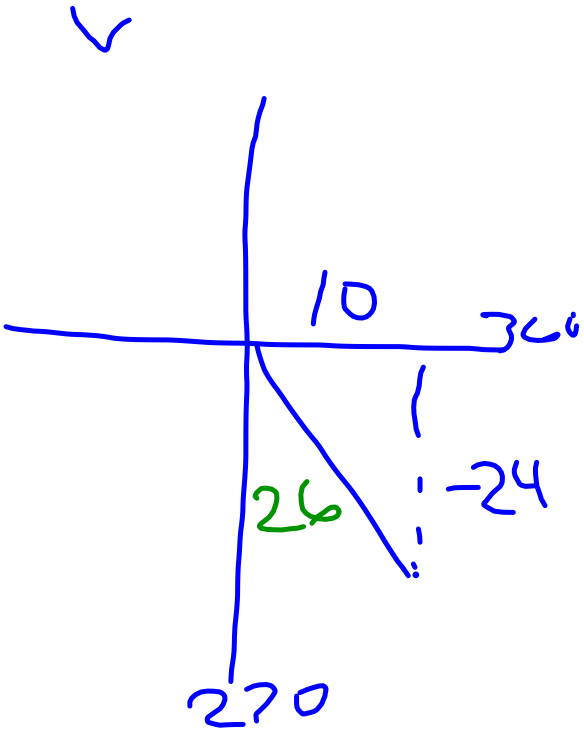
$(-7)^2+b^2=25^2$

$49+b^2=625$

$-49 \quad -49$

$\sqrt{b^2}=\sqrt{576}$

$b=24$



$a^2+b^2=c^2$

$10^2+(-24)^2$

$100+576=c^2$

$\sqrt{676}=\sqrt{c^2}$

$26=c$

$\sin(105^\circ)$

$\sin(60+45)$

WRONG Fix it!

$\sin 60\cos 45 + \cos 60 \sin 45$

$\left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$

$\frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4}$

$\frac{\sqrt{6}+\sqrt{2}}{4}$

$\tan\theta \sec\theta \csc\theta - 1$

Rewrite

$\left(\frac{\sin\theta}{\cos\theta}\right)\left(\frac{1}{\cos\theta}\right)\left(\frac{1}{\sin\theta}\right) - 1$

Simplify

$\frac{1}{\cos^2\theta} - 1$

Rewrite

Pyth. ID.

$\sec^2\theta - 1$

$1 + \tan^2\theta - 1$

$\tan^2\theta$