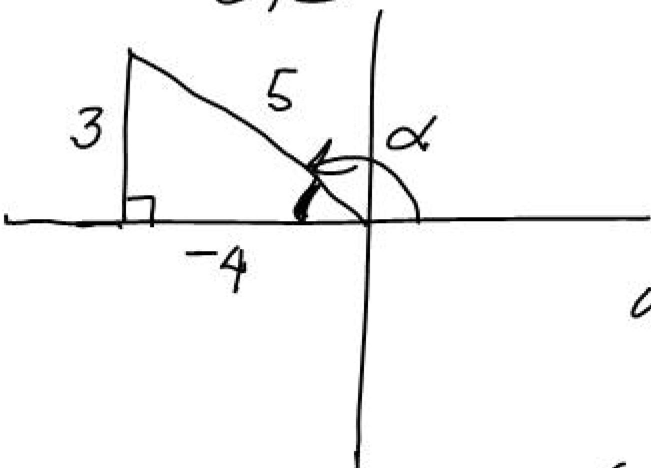
(1) $\underbrace{\tan\alpha = \frac{-3}{4}}_{\mathrm{II},\ \mathrm{IV}}$, $\underbrace{0 < \alpha < \pi}_{\mathrm{I},\ \mathrm{II}}$



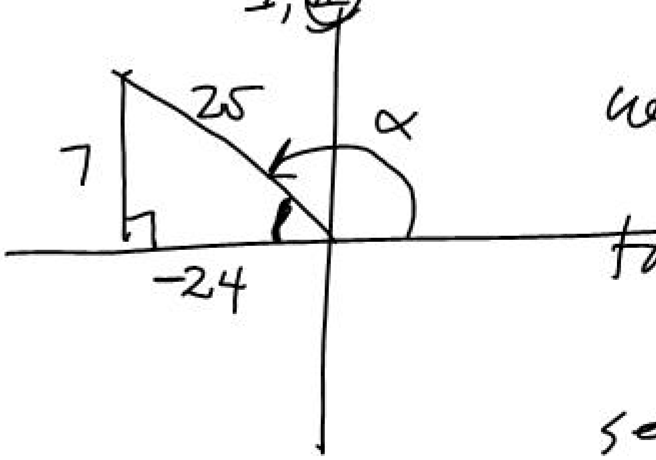
$$\sin\alpha = \frac{3}{5}$$

$$\cos\alpha = \frac{-4}{5}$$

reciprocals

$$\sec\alpha = \frac{-5}{4}$$

(4) $\underbrace{\sin\alpha = \frac{7}{25}}_{\mathrm{I},\ \mathrm{II}}$, $\underbrace{\frac{\pi}{2} < \alpha < \frac{3\pi}{2}}_{\mathrm{II},\ \mathrm{III}}$



$$\cos\alpha = \frac{-24}{25}$$

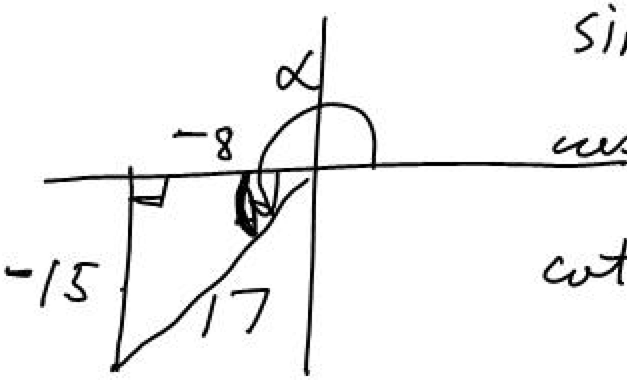
$$\tan\alpha = \frac{-7}{24}$$

$$\sec\alpha = \frac{-25}{24}$$

(7) $\underbrace{\sin\theta > 0}_{\mathrm{I},\ \mathrm{II}}$, $\underbrace{\cos\theta < 0}_{\mathrm{II},\ \mathrm{III}}$

(10) $\underbrace{\cos\theta > 0}_{\mathrm{I},\ \mathrm{IV}}$,

(10) $\underbrace{\tan \alpha = \frac{15}{8}}_{\text{I},\ \text{III}}, \ \underbrace{\sin \alpha < 0}_{\text{III},\ \text{IV}}$



$\sin \alpha = \frac{-15}{17}$

$\cos \alpha = \frac{-8}{17}$

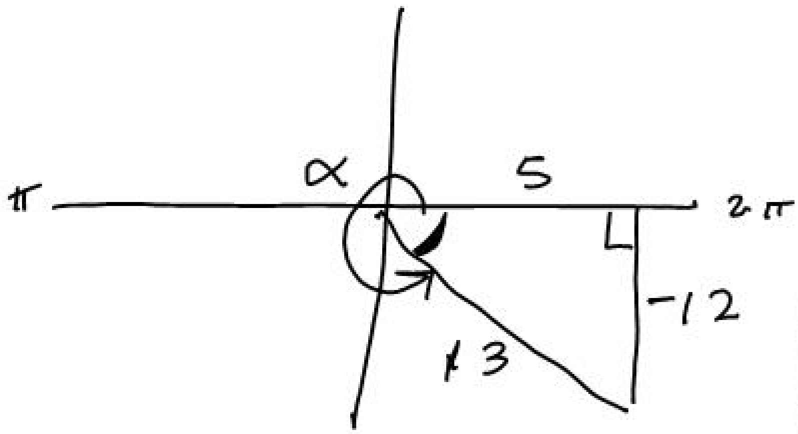
$\cot \alpha = \frac{8}{15}$

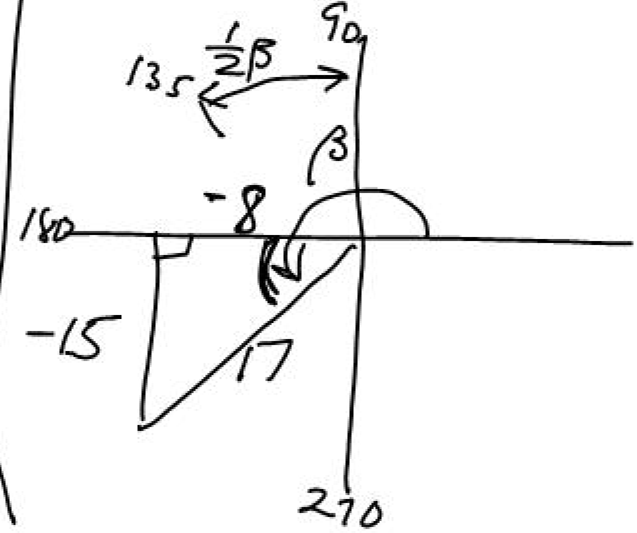
$\sec \alpha = \frac{-17}{8}$

$\csc \alpha = \frac{-17}{15}$

$\overbrace{\tan\alpha = \frac{-12}{5}}^{II,\ IV}, \ \overbrace{\pi < \alpha < 2\pi}^{III,\ IV}$

$\overbrace{\sin\beta = \frac{-15}{17}}^{III,\ IV}, \ \overbrace{\frac{\pi}{2} < \beta < \frac{3\pi}{2}}^{II,\ III}$





ⓒ $\sin 2\alpha = 2\sin\alpha\cos\alpha \leftarrow$ Double Angle Identity

$= 2\left(\frac{-12}{13}\right)\left(\frac{5}{13}\right) = \frac{-120}{169}$

$\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$

ⓔ $\underbrace{\sin\frac{\beta}{2}}_{II} = +\sqrt{\frac{1}{2} - \frac{1}{2}\cos\beta} \leftarrow$ $\frac{1}{2}$-angle formula

$= \sqrt{\frac{1}{2} - \frac{1}{2}\left(\frac{-8}{17}\right)}$

$= \sqrt{\frac{17+8}{34}} = \sqrt{\frac{25}{34}} = \frac{5}{\sqrt{34}}$

(f) $\sin(\alpha - \beta) = \sin\alpha\cos\beta - \sin\beta\cos\alpha$

$$= \left(\frac{+12}{13}\right)\left(\frac{+8}{17}\right) + \left(\frac{+15}{17}\right)\left(\frac{5}{13}\right)$$

$$\begin{array}{r} 17 \\ \times 13 \\ \hline 51 \\ 17 \\ \hline 221 \end{array}$$

$$= \frac{96}{221} + \frac{75}{221}$$

$$= \frac{171}{221}$$

(2) $\sin\frac{7\pi}{8} = \sin\frac{7\pi/4}{2} = +\sqrt{\frac{1}{2} - \frac{1}{2}\cancel{\cos\frac{7\pi}{4}}\cdot\frac{\sqrt{2}}{2}}$

quad II

$$= \sqrt{\frac{2-\sqrt{2}}{4}}$$

$$= \frac{\sqrt{2-\sqrt{2}}}{2}$$

$\frac{4\pi}{12} + \frac{3\pi}{12}$

$\downarrow$

$\cos\frac{7\pi}{12} = \cos\left(\frac{\pi}{3} + \frac{\pi}{4}\right)$

use $\cos(\alpha+\beta)$ formula

3) $$\frac{\sin\theta(1-\cos\theta)}{(1+\cos\theta)(1-\cos\theta)} + \frac{\cos\theta(1+\cos\theta)}{(1-\cos\theta)(1+\cos\theta)}$$

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

4a) $$\frac{(1-\sin\theta)\cancel{(1+\sin\theta)}}{\cancel{1+\sin\theta}}$$

6) $$\frac{\cancel{(\tan\theta+1)}(\tan\theta+2)}{(1-\tan\theta)\cancel{(1+\tan\theta)}}$$

5c) $2\cos^2\theta - 5\cos\theta - 3 = 0$

$(2\cos\theta + 1)(\cos\theta - 3) = 0$

$\cos\theta = -\frac{1}{2}$ $\quad$ $\cancel{\cos\theta = 3}$

$$\boxed{\theta = \frac{2\pi}{3}, \frac{4\pi}{3}}$$

(7) $\frac{\sin^2\theta}{\cancel{\cos^2\theta}} \cdot \cancel{\cos^2\theta} + \frac{\cos^2\theta}{\cancel{\sin^2\theta}} \cdot \cancel{\sin^2\theta}$

$\sin^2\theta + \cos^2\theta$

1 ✓

HW One Trig value from another

Trig Review # 1