

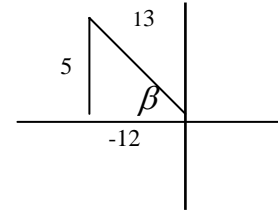
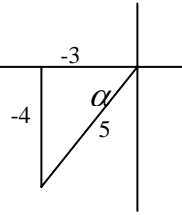
Solution of Recitation Problems of Sections: 6.1-6.2

$$\begin{aligned}
 \mathbf{1(a)} \quad LHS &= \frac{\sin^2 x - \cos^2 x}{-\sin x - \cos x} = \frac{(\sin x - \cos x)(\sin x + \cos x)}{-\cancel{(\sin x + \cos x)}} \\
 &= \cos x - \sin x = RHS
 \end{aligned}$$

$$\mathbf{1(b)} \quad LHS = \sqrt{\frac{1 - \cos x}{1 + \cos x} \cdot \frac{1 - \cos x}{1 - \cos x}} = \sqrt{\frac{(1 - \cos x)^2}{\sin^2 x}} = \frac{|1 - \cos x|}{|\sin x|} = \frac{1 - \cos x}{\sin x}$$

$$\mathbf{2.} \quad \sin \alpha = -\frac{4}{5} \text{ and } \sin \beta = \frac{5}{13}$$

$$\begin{aligned}
 \sin(\alpha + \beta) &= \sin \alpha \cos \beta + \cos \alpha \sin \beta \\
 &= \frac{-4}{5} \frac{12}{13} + \left(\frac{-3}{5}\right) \frac{5}{13} = \frac{33}{65}
 \end{aligned}$$



$$\Rightarrow \csc(\alpha + \beta) = \frac{65}{33}$$

3(a)

$$\begin{aligned}
 \cos 165^\circ &= -\cos 15^\circ = -\cos(45^\circ - 30^\circ) = \cos 45^\circ \cos 30^\circ + \sin 45^\circ \sin 30^\circ \\
 &= \frac{-\sqrt{6} + \sqrt{2}}{4}
 \end{aligned}$$

3(b)

$$\begin{aligned}
 &\cos(90^\circ - 13^\circ) \cos(90^\circ - 73^\circ) + \sin 77^\circ \sin 17^\circ \\
 &= \cos 77^\circ \cos 17^\circ + \sin 77^\circ \sin 17^\circ \\
 &= \cos(77^\circ - 17^\circ) = \cos 60^\circ = \frac{1}{2}
 \end{aligned}$$

$$\mathbf{3(c)} \quad \tan(69^\circ + 66^\circ) = \tan 135^\circ = -\tan 45^\circ = -1$$

$$\mathbf{4.} \quad = \sin \alpha + \sin 120^\circ \cos \alpha + \cos 120^\circ \sin \alpha + \sin 240^\circ \sin \alpha + \cos 240^\circ \sin \alpha$$

$$= \sin \alpha + \frac{\sqrt{3}}{2} \cos \alpha - \frac{1}{2} \sin \alpha - \frac{\sqrt{3}}{2} \cos \alpha - \frac{1}{2} \sin \alpha = 0$$