p. 320 #2c)

non-permissibles:
$\tan x$ is undef.
for $x = 90° \pm 180°n$

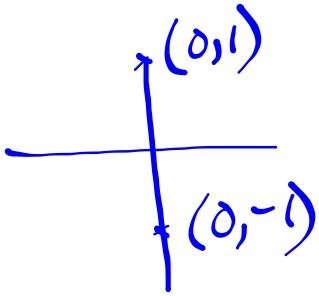
$\tan x \cos x \sin x - 1 = 0$

$\frac{\sin x}{\cos x} \cdot \cos x \sin x - 1 = 0$

$\sin^2 x - 1 = 0$

$\sin^2 x = 1$

$\sin x = \pm 1$



$x = 90° \pm 180°n, n \in W$

but, these are all non-permissible,

so, **no solution**

p. 320 # 36)

$2\cos^2 x - 3\sin x - 3 = 0$

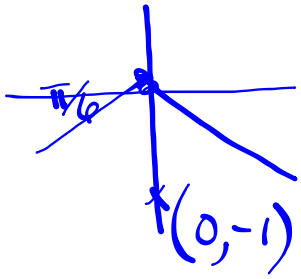
$2(1-\sin^2 x) - 3\sin x - 3 = 0$

$2 - 2\sin^2 x - 3\sin x - 3 = 0$

$2\sin^2 x + 3\sin x + 1 = 0$

$(2\sin x + 1)(\sin x + 1) = 0$

$\sin x = -\frac{1}{2}, -1$



$$x = \begin{cases} \frac{7\pi}{6} \pm 2\pi n \\ \frac{11\pi}{6} \pm 2\pi n \\ \frac{3\pi}{2} \pm 2\pi n \end{cases}, n \in W$$

For specified domain:

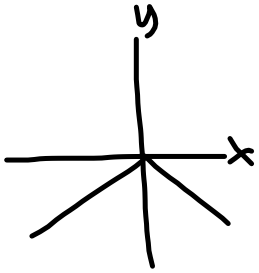
$x = \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{3\pi}{2}$

p. 321 #11)

$$\sqrt{3}\cos x \csc x = -2\cos x$$

$$\sqrt{3}\cos x \csc x + 2\cos x = 0$$

$$\cos x\left(\sqrt{3}\csc x + 2\right) = 0$$



$\cos x = 0$, $\csc x = \frac{-2}{\sqrt{3}}$

$\sin x = \frac{-\sqrt{3}}{2}$

$x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{4\pi}{3}, \frac{5\pi}{3}$

p.306 # 8e) Find exact value.

$$\csc\frac{\pi}{12} = \csc\left(\frac{3\pi}{12} - \frac{2\pi}{12}\right)$$

$$= \csc\left(\frac{\pi}{4} - \frac{\pi}{6}\right)$$

$\csc 15°$
$= \csc(45° - 30°)$

$$= \frac{1}{\sin\left(\frac{\pi}{4} - \frac{\pi}{6}\right)}$$

$$= \frac{1}{\sin\frac{\pi}{4}\cos\frac{\pi}{6} - \sin\frac{\pi}{6}\cos\frac{\pi}{4}}$$

$$= \frac{1}{\frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2} - \frac{1}{2}\cdot\frac{\sqrt{2}}{2}}$$

$$= \frac{1}{\frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4}}$$

$$= \frac{1}{\frac{\sqrt{6}-\sqrt{2}}{4}}$$

$$= \frac{4}{\sqrt{6}-\sqrt{2}} \cdot \frac{\sqrt{6}+\sqrt{2}}{\sqrt{6}+\sqrt{2}}$$

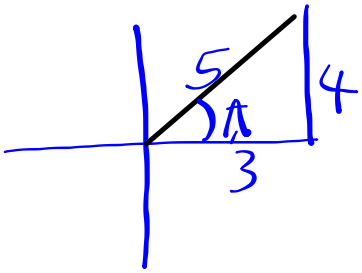
$$= \frac{4\sqrt{6} + 4\sqrt{2}}{6-2}$$

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

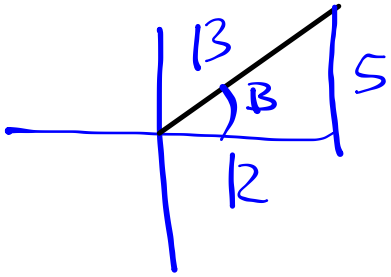
$$= \boxed{\sqrt{6} + \sqrt{2}}$$

p. 306 # 20b)

$\sin A = \frac{4}{5}$ given



$\cos B = \frac{12}{13}$



$\sin(A+B)$

$= \sin A \cos B + \cos A \sin B$

$= \frac{4}{5} \cdot \frac{12}{13} + \frac{3}{5} \cdot \frac{5}{13}$

$= \frac{48}{65} + \frac{15}{65}$

$= \boxed{\frac{63}{65}}$