1) $\cot\theta = -1.9$ find $\tan\left(\theta - \frac{\pi}{2}\right)$

2) $\cot x = -\frac{4}{3}$ + $\sin x < 0$ find $\sec x$

3) $1 + \cos x = \sqrt{3}\sin x$ all solutions

1] $\cot\theta = -1.9$ find $\tan\left(\theta - \frac{\pi}{2}\right)$

$$\tan\left(\theta - \frac{\pi}{2}\right) = \tan\left(-\left(\frac{\pi}{2} - \theta\right)\right)$$
$$= -\tan\left(\frac{\pi}{2} - \theta\right)$$
$$= -\cot\theta$$
$$= 1.9$$

2] $\cot x = \frac{-4}{3}$ + $\sin x < 0$ find $\sec x$

$\tan x = \frac{-3}{4}$

$\tan^2 + 1 = \sec^2 x$

$\left(-\frac{3}{4}\right)^2 + 1 = \sec^2 x$

$\frac{9}{16} + \frac{16}{16} = \sec^2 x$

$\frac{25}{16} = \sec^2 x$

$\pm\sqrt{\frac{25}{16}} = \sec x$

$\boxed{\sec x = \frac{5}{4}}$

3] $(1 + \cos x)^2 = (\sqrt{3}\sin x)^2$ all solutions

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

$\cos^2 x + 2\cos x + 1 = 3(1 - \cos^2 x)$

$= 3 - 3\cos^2 x$

$\frac{4\cos^2 x + 2\cos x - 2}{2} = 0$ $\quad -3 + 3\cos^2 x$

$2\cos^2 x + \cos x - 1 = 0$

$(2\cos x - 1)(\cos x + 1) = 0$

$2\cos x - 1 = 0$ $\qquad \cos x + 1 = 0$

$\cos x = \frac{1}{2}$ $\qquad \cos x = -1$

$\frac{\pi}{3}, \frac{5\pi}{3}$ $\qquad \pi$

$\boxed{\frac{\pi}{3} + 2\pi n \qquad \pi + 2\pi n}$

$1 + \cos\frac{\pi}{3} = \sqrt{3}\sin\frac{\pi}{3}$

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

$\frac{3}{2} = \frac{3}{2}$ ✓

$1 + \cos\frac{5\pi}{3} = \sqrt{3}\sin\frac{5\pi}{3}$

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

$1 + \cos\pi = \sqrt{3}\sin\pi$

$1 + -1 = \sqrt{3}(0)$ ✓