8 In this question you must show detailed reasoning.

(a) Express $\cos x + \sqrt{3}\sin x$ in the form $R\sin(x+\alpha)$, where $R > 0$ and $0 < \alpha < \frac{1}{2}\pi$. Give the values of R and α in exact form. **[4]**

(b) Hence solve the equation $\cos x = \sqrt{3}(1-\sin x)$ for values of x in the interval $-\pi \leqslant x \leqslant \pi$. Give the roots of this equation in exact form. **[4]**