

$\frac{\sin \alpha}{1 + \cos \alpha} = \frac{1 + \cos \alpha}{\sin \alpha} \rightarrow \sin^2 \alpha = \cos^2 \alpha + 1 + 2 \cos \alpha \rightarrow 2 \cos^2 \alpha + 2 \cos \alpha = 0 \rightarrow$ $2 \cos \alpha (\cos \alpha + 1) = 0 \rightarrow \cos \alpha = 0 \text{ or } -1 \rightarrow \cos \frac{x}{2} = \{0, -1\}$ مميز: $[-\pi, \frac{\pi}{2}]$ $ -\pi - \pi = 2\pi$	6
$\cos^2 x - \sin^2 x \cos^2 x = 1 \rightarrow \sin^2 x \cos^2 x \cdot \frac{\cos^2 x}{-\sin^2 x} = 1 \rightarrow \sin^2 x (\cos^2 x + 1) = 0 \rightarrow$ $\sin^2 x = 0 \text{ or } \cos^2 x = -1 \rightarrow x = \{k\pi\} \text{ or } x = \{2k\pi + \pi\} \rightarrow x = \left\{ \frac{2k\pi}{2} + \frac{\pi}{2} \right\} \Rightarrow$ مميز: $x = \left\{ \frac{2k\pi}{2} + \frac{\pi}{2}, k\pi \right\}$	7
$\frac{1 - \tan x}{1 + \tan x} = \tan x \xrightarrow{\tan \frac{\pi}{4} = 1} \frac{\tan \frac{\pi}{4} - \tan x}{1 + \tan \frac{\pi}{4} \tan x} = \tan \pi \rightarrow$ $\tan\left(\frac{\pi}{4} - x\right) = \tan \pi \rightarrow \pi = k\pi + \frac{\pi}{4} - x \rightarrow x = k\pi + \frac{\pi}{4} \rightarrow$ $x = \frac{k\pi}{4} + \frac{\pi}{4}$	8
$\sqrt{\sin^2 x + \cos^2 x + 2 \sin x \cos x} = \sqrt{2} (\cos x - \sin x) \rightarrow \sin x + \cos x = \sqrt{2} (\sin x - \cos x) \rightarrow$ $\begin{cases} \sqrt{2} \cos x = \sqrt{2} \sin x \rightarrow \cos x = \sin x \rightarrow x = \left\{ 2k\pi + \frac{\pi}{4} \right\} \\ \sqrt{2} \cos x = -\sqrt{2} \sin x \rightarrow \sin x = -\cos x \rightarrow x = \left\{ 2k\pi - \frac{\pi}{4} \right\} \end{cases} \rightarrow x = \left\{ k\pi + \frac{\pi}{4} \right\}$	9
أ) $\sin^2 x - \cos^2 x = 1 \rightarrow \sin^2 x - \cos^2 x = -1 \rightarrow -\cos^2 x = -1 \rightarrow \cos^2 x = 1 \rightarrow x = \{2k\pi + \pi\} \rightarrow$ $\alpha = \left\{ k\pi + \frac{\pi}{2} \right\} \rightarrow$ مميز: $\frac{\pi}{2}$ ب) $\sin^2 x - \cos^2 x = -1$ $\left. \begin{array}{l} \cos^2 x = 1, \sin^2 x = 0 \rightarrow x = 0, 2\pi \\ \cos^2 x = 0, \sin^2 x = 1 \rightarrow x = \frac{\pi}{2} \end{array} \right\} x = \left\{ 0, \frac{\pi}{2}, 2\pi \right\}$ مميز: $\frac{\pi}{2}$	10