2.36
1

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

① $0 \le \Delta$

$$4\sin^2\alpha - 4 + 4\cos\alpha > 0$$
$$4(1 - \cos^2\alpha) - 4 + 4\cos\alpha > 0 \quad /{:}4$$
$$\Rightarrow \cos^2\alpha - \cos\alpha = \cos\alpha(\cos\alpha - 1)$$

$\frac{\pi}{2} + \pi k$ $\qquad$ $2\pi k$

$$0 \le \alpha \le \frac{\pi}{2} \quad \text{או} \quad \frac{3\pi}{2} \le \alpha \le 2\pi$$

② $\Delta = 0$ $\qquad$ $0, \frac{\pi}{2}, \frac{3\pi}{2}, 2\pi$

④ $\Delta \ge 0 \rightarrow 0 \le \alpha \le \frac{\pi}{2}, \; \frac{3\pi}{2} \le \alpha \le 2\pi$ $\Big\}$

$\dfrac{-b}{a} > 0 \rightarrow \dfrac{2\sin\alpha}{1} > 0 \rightarrow 0 < \alpha < \pi$

$\dfrac{c}{a} > 0 \rightarrow 1 - \cos\alpha > 0 \rightarrow \alpha \ne 2\pi k$

$$0 \le \alpha < \frac{\pi}{2}$$

$0 < \alpha < \pi$ $\qquad$ $0 < \dfrac{-b}{2a}$

כאשר $\alpha = 0$ שני השורשים שווים (השורש הכפול שווה) לכן
$\frac{\pi}{2}$ וגם $\Delta = 0$

③ $\Delta > 0 \rightarrow 0 < \alpha < \frac{\pi}{2}, \; \frac{3\pi}{2} < \alpha < 2\pi$

$\dfrac{-b}{a} = 1 \rightarrow 2\sin\alpha = 1$

$\qquad \sin\alpha = 1/2$

$\qquad \alpha = \dfrac{\pi}{6} + 2\pi k \longrightarrow \boxed{\alpha = \dfrac{\pi}{6}}$