

2.36
1

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

① $0 \leq \Delta$

$$4 \sin^2 \alpha - 4 + 4 \cos \alpha > 0$$

$$4(1 - \cos^2 \alpha) - 4 + 4 \cos \alpha > 0 \quad /:4$$

$$0 > \cos^2 \alpha - \cos \alpha = \cos \alpha (\cos \alpha - 1)$$

$$\frac{\pi}{2} + \pi k \quad \downarrow \quad 2\pi k$$



$$0 \leq \alpha \leq \frac{\pi}{2} \quad \vee \quad \frac{3\pi}{2} \leq \alpha \leq 2\pi$$

② $\Delta = 0$

$$0, \frac{\pi}{2}, \frac{3\pi}{2}, 2\pi$$

③

$$\begin{aligned} \Delta > 0 &\rightarrow 0 \leq \alpha \leq \frac{\pi}{2}, \quad \frac{3\pi}{2} \leq \alpha \leq 2\pi \\ \frac{b}{2a} > 0 &\rightarrow \frac{2 \sin \alpha}{2} > 0 \rightarrow 0 < \alpha < \pi \\ \frac{b}{2a} < 0 &\rightarrow 1 - \cos \alpha > 0 \rightarrow \alpha \neq 2\pi k \end{aligned} \quad \left. \vphantom{\begin{aligned} \Delta > 0 \\ \frac{b}{2a} > 0 \\ \frac{b}{2a} < 0 \end{aligned}} \right\} 0 < \alpha < \frac{\pi}{2}$$

$0 < \alpha < \pi$ $\sqrt{b^2 - 4ac}$ $0 < \frac{-b}{2a}$ (признак произведения) $\frac{\pi}{2}$ $\Delta = 0$ $\frac{\pi}{2}$

④

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

$$\begin{aligned} \frac{b}{2a} > 0 &\rightarrow 2 \sin \alpha = k \\ \sin \alpha &= 1/2 \\ \alpha &= \frac{\pi}{6} + 2\pi k \end{aligned} \rightarrow \boxed{\alpha = \frac{\pi}{6}}$$