1.

$$\begin{aligned}
\sin x &= -\frac{\sqrt{2}}{2}\\
\sin x' &= \frac{\sqrt{2}}{2}\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{4}\\
III. \quad x_{III} &= \pi + x_0 + 2k\pi = \tfrac{5}{4}\pi + 2k\pi\\
IV. \quad x_{IV} &= 2\pi - x_0 + 2k\pi = \tfrac{7}{4}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{5}{4}\pi + \mathbf{2k}\pi;\ \tfrac{7}{4}\pi + \mathbf{2k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

2.

$$\begin{aligned}
\sin x &= -\frac{\sqrt{3}}{2}\\
\sin x' &= \frac{\sqrt{3}}{2}\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{3}\\
III. \quad x_{III} &= \pi + x_0 + 2k\pi = \tfrac{4}{3}\pi + 2k\pi\\
IV. \quad x_{IV} &= 2\pi - x_0 + 2k\pi = \tfrac{5}{3}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{4}{3}\pi + \mathbf{2k}\pi;\ \tfrac{5}{3}\pi + \mathbf{2k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

3.

$$\begin{aligned}
\cos x &= -\frac{1}{2}\\
\cos x' &= \frac{1}{2}\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{3}\\
II. \quad x_{II} &= \pi - x_0 + 2k\pi = \tfrac{2}{3}\pi + 2k\pi\\
III. \quad x_{III} &= \pi + x_0 + 2k\pi = \tfrac{4}{3}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{2}{3}\pi + \mathbf{2k}\pi;\ \tfrac{4}{3}\pi + \mathbf{2k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

4.

$$\begin{aligned}
\cos x &= -\frac{\sqrt{2}}{2}\\
\cos x' &= \frac{\sqrt{2}}{2}\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{4}\\
II. \quad x_{II} &= \pi - x_0 + 2k\pi = \tfrac{3}{4}\pi + 2k\pi\\
III. \quad x_{III} &= \pi + x_0 + 2k\pi = \tfrac{5}{4}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{3}{4}\pi + \mathbf{2k}\pi;\ \tfrac{5}{4}\pi + \mathbf{2k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

5.

$$\mathcal{D} : \boxed{x \neq (2k+1)\tfrac{\pi}{2}}$$

$$\begin{aligned}
\mathrm{tg}\ x &= -\frac{\sqrt{3}}{3}\\
\mathrm{tg}\ x' &= \frac{\sqrt{3}}{3}\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{6}\\
II. \quad x_{II} &= \pi - x_0 + k\pi = \tfrac{5}{6}\pi + k\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{5}{6}\pi + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

6.

$$\mathcal{D} : \boxed{x \neq (2k+1)\tfrac{\pi}{2}}$$

$$\begin{aligned}
\mathrm{tg}\ x &= -1\\
\mathrm{tg}\ x' &= 1\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{4}\\
II. \quad x_{II} &= \pi - x_0 + k\pi = \tfrac{3}{4}\pi + k\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{3}{4}\pi + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

7.

$$\mathcal{D} : \boxed{x \neq k\pi}$$

$$\begin{aligned}
\mathrm{cotg}\ x &= -\frac{\sqrt{3}}{3}\\
\mathrm{cotg}\ x' &= \frac{\sqrt{3}}{3}\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{3}\\
II. \quad x_{II} &= \pi - x_0 + k\pi = \tfrac{2}{3}\pi + k\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{2}{3}\pi + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

8.

$$\mathcal{D} : \boxed{x \neq k\pi}$$

$$\begin{aligned}
\mathrm{cotg}\ x &= -\sqrt{3}\\
\mathrm{cotg}\ x' &= \sqrt{3}\\
\Rightarrow \quad x_0 &= \tfrac{\pi}{6}\\
II. \quad x_{II} &= \pi - x_0 + k\pi = \tfrac{5}{6}\pi + k\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{5}{6}\pi + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

9.

$$\mathcal{D} : \boxed{x + \tfrac{\pi}{6} \neq (2k+1)\tfrac{\pi}{2}} \qquad S : \boxed{x + \tfrac{\pi}{6} = y}$$

$$\begin{aligned}
\mathrm{tg}\ (x + \tfrac{\pi}{6}) &= \frac{\sqrt{3}}{3}\\
\Rightarrow \quad \mathrm{tg}\ y &= \frac{\sqrt{3}}{3}\\
\Rightarrow \quad y_0 &= \tfrac{\pi}{6}\\
I. \quad y_I &= y_0 + k\pi = \tfrac{\pi}{6} + k\pi\\
\boxed{S:} \Rightarrow \quad x + \tfrac{\pi}{6} &= \tfrac{\pi}{6} + k\pi\\
x &= k\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

10.

$$\mathcal{D} : \boxed{x - \tfrac{\pi}{2} \neq k\pi} \qquad S : \boxed{x - \tfrac{\pi}{2} = y}$$

$$\begin{aligned}
\mathrm{cotg}\ (x - \tfrac{\pi}{2}) &= -1\\
\Rightarrow \quad \mathrm{cotg}\ y &= -1\\
\mathrm{cotg}\ y' &= 1\\
\Rightarrow \quad y_0 &= \tfrac{\pi}{4}\\
II. \quad y_{II} &= \pi - y_0 + k\pi = \tfrac{3}{4}\pi + k\pi\\
\boxed{S:} \Rightarrow \quad x - \tfrac{\pi}{2} &= \tfrac{3}{4}\pi + k\pi\\
x &= \tfrac{5}{4}\pi + k\pi\\
x &= \tfrac{\pi}{4} + (k+1)\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{4} + (\mathbf{k}+\mathbf{1})\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

11.

$$S : \boxed{x - \tfrac{\pi}{3} = y}$$

$$\begin{aligned}
\sin(\tfrac{\pi}{3} - x) &= -\frac{\sqrt{2}}{2}\\
\sin[-(x - \tfrac{\pi}{3})] &= -\frac{\sqrt{2}}{2}\\
\Rightarrow \quad -\sin(x - \tfrac{\pi}{3}) &= -\frac{\sqrt{2}}{2}\\
\sin(x - \tfrac{\pi}{3}) &= \frac{\sqrt{2}}{2}\\
\Rightarrow \quad \sin y &= \frac{\sqrt{2}}{2}\\
\Rightarrow \quad y_0 &= \tfrac{\pi}{4}\\
I. \quad y_I &= y_0 + 2k\pi = \tfrac{\pi}{4} + 2k\pi\\
\boxed{S:} \Rightarrow \quad x_1 - \tfrac{\pi}{3} &= \tfrac{\pi}{4} + 2k\pi\\
x_1 &= \tfrac{7}{12}\pi + 2k\pi\\
II. \quad y_{II} &= \pi - y_0 + 2k\pi = \tfrac{3}{4}\pi + 2k\pi\\
\boxed{S:} \Rightarrow \quad x_2 - \tfrac{\pi}{3} &= \tfrac{3}{4}\pi + 2k\pi\\
x_2 &= \tfrac{13}{12}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{7}{12}\pi + \mathbf{2k}\pi;\ \tfrac{13}{12}\pi + \mathbf{2k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

12.

$$\begin{aligned}
\cos(\tfrac{\pi}{6} - x) &= -\frac{\sqrt{3}}{2}\\
\cos[-(x - \tfrac{\pi}{6})] &= -\frac{\sqrt{3}}{2}\\
\Rightarrow \quad \cos(x - \tfrac{\pi}{6}) &= -\frac{\sqrt{3}}{2}\\
\Rightarrow \quad \cos y &= -\frac{\sqrt{3}}{2}
\end{aligned}$$

$$S : \boxed{x - \tfrac{\pi}{6} = y}$$

$$\begin{aligned}
\cos y' &= \frac{\sqrt{3}}{2}\\
\Rightarrow \quad y_0 &= \tfrac{\pi}{6}\\
II. \quad y_{II} &= \pi - y_0 + 2k\pi = \tfrac{5}{6}\pi + 2k\pi\\
\boxed{S:} \Rightarrow \quad x_1 - \tfrac{\pi}{6} &= \tfrac{5}{6}\pi + 2k\pi\\
x_1 &= \pi + 2k\pi\\
III. \quad y_{III} &= \pi + y_0 + 2k\pi = \tfrac{7}{6}\pi + 2k\pi\\
\boxed{S:} \Rightarrow \quad x_2 - \tfrac{\pi}{6} &= \tfrac{7}{6}\pi + 2k\pi\\
x_2 &= \tfrac{4}{3}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\pi + \mathbf{2k}\pi;\ \tfrac{4}{3}\pi + \mathbf{2k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

13.

$$\mathcal{D} : \boxed{\tfrac{\pi}{3} - x \neq k\pi} \qquad S : \boxed{x - \tfrac{\pi}{3} = y}$$

$$\begin{aligned}
-\sqrt{3}\ \mathrm{cotg}\ (\tfrac{\pi}{3} - x) &= 3\\
-\sqrt{3}\ \mathrm{cotg}\ [-(x - \tfrac{\pi}{3})] &= 3\\
\Rightarrow \quad \sqrt{3}\ \mathrm{cotg}\ (x - \tfrac{\pi}{3}) &= 3\\
\mathrm{cotg}\ (x - \tfrac{\pi}{3}) &= \frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}\\
\mathrm{cotg}\ (x - \tfrac{\pi}{3}) &= \sqrt{3}\\
\Rightarrow \quad \mathrm{cotg}\ y &= \sqrt{3}\\
\Rightarrow \quad y_0 &= \tfrac{\pi}{6}\\
I. \quad y_I &= y_0 + k\pi = \tfrac{\pi}{6} + k\pi\\
\boxed{S:} \Rightarrow \quad x - \tfrac{\pi}{3} &= \tfrac{\pi}{6} + k\pi\\
x &= \tfrac{\pi}{2} + k\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{2} + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

14.

$$\begin{aligned}
\sin^2 x &= \frac{3}{4} \qquad /\sqrt{\ } \\
|\sin x| &= \frac{\sqrt{3}}{2} \\
\sin x &= \pm\frac{\sqrt{3}}{2} \\
\Rightarrow \quad x_0 &= \tfrac{\pi}{3} \\
I. \quad x_I &= x_0 + 2k\pi = \tfrac{\pi}{3} + 2k\pi \\
II. \quad x_{II} &= \pi - x_0 + 2k\pi = \tfrac{2}{3}\pi + 2k\pi \\
III. \quad x_{III} &= \pi + x_0 + 2k\pi = \tfrac{4}{3}\pi + 2k\pi \\
IV. \quad x_{IV} &= 2\pi - x_0 + 2k\pi = \tfrac{5}{3}\pi + 2k\pi \\
\Rightarrow \quad x_1 &= \tfrac{\pi}{3} + k\pi \\
\Rightarrow \quad x_2 &= \tfrac{2}{3}\pi + k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{3} + \mathbf{k}\pi;\ \tfrac{2}{3}\pi + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

15.

$$\begin{aligned}
\cos^2 x &= \frac{1}{2} \qquad /\sqrt{\ } \\
|\cos x| &= \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \\
\cos x &= \pm\frac{\sqrt{2}}{2} \\
\Rightarrow \quad x_0 &= \tfrac{\pi}{4} \\
I. \quad x_I &= x_0 + 2k\pi = \tfrac{\pi}{4} + 2k\pi \\
IV. \quad x_{IV} &= 2\pi - x_0 + 2k\pi = \tfrac{7}{4}\pi + 2k\pi \\
II. \quad x_{II} &= \pi - x_0 + 2k\pi = \tfrac{3}{4}\pi + 2k\pi \\
III. \quad x_{III} &= \pi + x_0 + 2k\pi = \tfrac{5}{4}\pi + 2k\pi \\
\Rightarrow \quad x &= \tfrac{\pi}{4} + k\tfrac{\pi}{2}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{4} + \mathbf{k}\tfrac{\pi}{2};\ \mathbf{k} \in \mathcal{Z}\}$$

16.

$$\begin{aligned}
\operatorname{tg}^2 x &= 3 \qquad /\sqrt{\ } \qquad \mathcal{D}: \boxed{x \neq (2k+1)\tfrac{\pi}{2}} \\
|\operatorname{tg} x| &= \sqrt{3} \\
\operatorname{tg} x &= \pm\sqrt{3} \\
\Rightarrow \quad x_0 &= \tfrac{\pi}{3} \\
I. \quad x_I &= x_0 + k\pi = \tfrac{\pi}{3} + k\pi \ \in \mathcal{D} \\
II. \quad x_{II} &= = \pi - x_0 + k\pi = \tfrac{2}{3}\pi + k\pi \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{3} + \mathbf{k}\pi;\ \tfrac{2}{3}\pi + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

17.

$$\begin{aligned}
\operatorname{cotg}^2 x &= 1 \qquad /\sqrt{\ } \qquad \mathcal{D}: \boxed{x \neq k\pi} \\
|\operatorname{cotg} x| &= 1 \\
\operatorname{cotg} x &= \pm 1 \\
\Rightarrow \quad x_0 &= \tfrac{\pi}{4} \\
I. \quad x_I &= x_0 + k\pi = \tfrac{\pi}{4} + k\pi \\
II. \quad x_{II} &= \pi - x_0 + k\pi = \tfrac{3}{4}\pi + k\pi \\
\Rightarrow \quad x &= \tfrac{\pi}{4} + k\tfrac{\pi}{2} \ \in \mathcal{D}
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{4} + \mathbf{k}\tfrac{\pi}{2};\ \mathbf{k} \in \mathcal{Z}\}$$

18.

$$\begin{aligned}
\sin 2x &= \cos 3x \sin 2x \\
\sin 2x - \cos 3x \sin 2x &= 0 \\
\sin 2x\,(1 - \cos 3x) &= 0 \\
\Rightarrow \quad \sin 2x = 0 \quad &\vee \quad 1 - \cos 3x = 0 \\
2x = k\pi \quad & \quad \cos 3x = 1 \\
x_1 = k\tfrac{\pi}{2} \quad & \quad 3x = 2k\pi \\
& \quad x_2 = k\tfrac{2}{3}\pi
\end{aligned}$$

$$\mathbf{K} = \{\mathbf{k}\tfrac{\pi}{2};\ \mathbf{k}\tfrac{2}{3}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

19.

$$\begin{aligned}
\sin 2x + \sqrt{3}\cos x &= 0 \\
2\sin x\cos x + \sqrt{3}\cos x &= 0 \\
\cos x\,(2\sin x + \sqrt{3}) &= 0 \\
\Rightarrow \quad \cos x = 0 \quad &\vee \quad 2\sin x + \sqrt{3} = 0 \\
x_1 = (2k+1)\tfrac{\pi}{2} \quad & \quad \sin x = -\frac{\sqrt{3}}{2} \\
& \quad \sin x' = \frac{\sqrt{3}}{2} \\
&\Rightarrow \quad x_0 = \tfrac{\pi}{3} \\
&III. \quad x_2 = \tfrac{4}{3}\pi + 2k\pi \\
&IV. \quad x_3 = \tfrac{5}{3}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{(2\mathbf{k}+1)\tfrac{\pi}{2};\ \tfrac{4}{3}\pi + 2\mathbf{k}\pi;\ \tfrac{5}{3}\pi + 2\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

20.

$$\begin{aligned}
\cos x &= \sin 2x \cos x \qquad / \cdot (-1) \\
\sin 2x\cos x - \cos x &= 0 \\
\cos x(\sin 2x - 1) &= 0 \\
\Rightarrow \quad \cos x = 0 \quad &\vee \quad \sin 2x - 1 = 0 \\
x_1 = (2k+1)\tfrac{\pi}{2} \quad & \quad \sin 2x = 1 \\
& \quad 2x = \tfrac{\pi}{2} + 2k\pi \\
& \quad x_2 = \tfrac{\pi}{4} + k\pi
\end{aligned}$$

$$\mathbf{K} = \{(2\mathbf{k}+1)\tfrac{\pi}{2};\ \tfrac{\pi}{4} + \mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

21.

$$\begin{aligned}
\sin^2 x + 2\sin x - 3 &= 0 \qquad S: \boxed{\sin x = y} \\
\Rightarrow \quad y^2 + 2y - 3 &= 0 \\
V.v. \Rightarrow \quad y_1 = 1 &\ \vee\ y_2 = -3 \\
\boxed{S:} \Rightarrow \quad \sin x = 1 &\quad \vee \quad \sin x = -3 \quad V_n! \\
x &= \tfrac{\pi}{2} + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{2} + 2\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

22.

$$\begin{aligned}
2\sin^2 x + 3\sin x + 1 &= 0 \qquad S: \boxed{\sin x = y} \\
\Rightarrow \quad 2y^2 + 3y + 1 &= 0 \\
D = 9 - 8 = 1 &\qquad \sqrt{D} = 1 \\
y_{1,2} = \frac{-3 \pm 1}{4} &= \left\langle \begin{matrix} -\frac{1}{2} \\ -1 \end{matrix} \right. \\
\boxed{S:} \Rightarrow \quad \sin x = -\frac{1}{2} &\quad \vee \quad \sin x = -1 \\
\sin x' = \frac{1}{2} &\quad \quad x_3 = \tfrac{3}{2}\pi + 2k\pi \\
\Rightarrow \quad x_0 &= \tfrac{\pi}{6} \\
III. \quad x_1 &= \tfrac{7}{6}\pi + 2k\pi \\
IV. \quad x_2 &= \tfrac{11}{6}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{7}{6}\pi + 2\mathbf{k}\pi;\ \tfrac{11}{6}\pi + 2\mathbf{k}\pi;\ \tfrac{3}{2}\pi + 2\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

23.

$$\begin{aligned}
2\sin^3 x &= \sin^2 x + \sin x \qquad S: \boxed{\sin x = y} \\
2\sin^3 x - \sin^2 x - \sin x &= 0 \\
\sin x(2\sin^2 x - \sin x - 1) &= 0 \\
\Rightarrow \quad \sin x = 0 \quad &\vee \quad 2\sin^2 x - \sin x - 1 = 0 \\
x_1 = k\pi \quad &\Rightarrow \quad 2y^2 - y - 1 = 0 \\
&D = 1 + 8 = 9 \qquad \sqrt{D} = 3 \\
&y_{1,2} = \frac{1 \pm 3}{4} = \left\langle \begin{matrix} 1 \\ -\frac{1}{2} \end{matrix} \right. \\
\boxed{S:} \Rightarrow \quad \sin x = 1 \quad &\vee \quad \sin x = -\frac{1}{2} \\
x_2 = \tfrac{\pi}{2} + 2k\pi \quad & \quad \sin x' = \frac{1}{2} \\
&\Rightarrow \quad x_0 = \tfrac{\pi}{6} \\
&III. \quad x_3 = \tfrac{7}{6}\pi + 2k\pi \\
&IV. \quad x_4 = \tfrac{11}{6}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\mathbf{k}\pi;\ \tfrac{\pi}{2} + 2\mathbf{k}\pi;\ \tfrac{7}{6}\pi + 2\mathbf{k}\pi;\ \tfrac{11}{6}\pi + 2\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

24.

$$\begin{aligned}
2\cos^2 x + 5\cos x - 3 &= 0 \qquad S: \boxed{\cos x = y} \\
\Rightarrow \quad 2y^2 + 5y - 3 &= 0 \\
D = 25 + 24 = 49 &\qquad \sqrt{D} = 7 \\
y_{1,2} = \frac{-5 \pm 7}{4} &= \left\langle \begin{matrix} \frac{1}{2} \\ -3 \end{matrix} \right. \\
\boxed{S:} \Rightarrow \quad \cos x = \frac{1}{2} &\quad \vee \quad \cos x = -3 \quad V_n! \\
I. \quad x_1 &= \tfrac{\pi}{3} + 2k\pi \\
IV. \quad x_2 &= \tfrac{5}{3}\pi + 2k\pi
\end{aligned}$$

$$\mathbf{K} = \{\tfrac{\pi}{3} + 2\mathbf{k}\pi;\ \tfrac{5}{3}\pi + 2\mathbf{k}\pi\!:\ \mathbf{k} \in \mathcal{Z}\}$$

25.

$$\begin{aligned} 2\cos^2 x &= 3\sin x \\ 2\left(1-\sin^2 x\right) &= 3\sin x \qquad /\cdot(-1) \\ 2\sin^2 x + 3\sin x - 2 &= 0 \qquad S: \boxed{\sin x = y} \\ \Rightarrow \quad 2y^2 + 3y - 2 &= 0 \end{aligned}$$

$$D = 9 + 16 = 25 \qquad \sqrt{D} = 5$$

$$y_{1,2} = \frac{-3 \pm 5}{4} = \left\langle \begin{matrix} \frac{1}{2} \\ -2 \end{matrix} \right.$$

$$\boxed{S:} \Rightarrow \quad \sin x = \frac{1}{2} \quad \vee \quad \sin x = -2 \ \ V_n!$$

$$I. \quad x_1 = \tfrac{\pi}{6} + 2k\pi$$

$$II. \quad x_2 = \tfrac{5}{6}\pi + 2k\pi$$

$$\mathbf{K} = \{\tfrac{\pi}{6} + 2\mathbf{k}\pi;\ \tfrac{5}{6}\pi + 2\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

26.

$$\begin{aligned} 2\cos^2 x &= \sin x + 1 \\ 2 - 2\sin^2 x - \sin x - 1 &= 0 \qquad /\cdot(-1) \\ 2\sin^2 x + \sin x - 1 &= 0 \qquad S: \boxed{\sin x = y} \\ \Rightarrow \quad 2y^2 + y - 1 &= 0 \end{aligned}$$

$$D = 1 + 8 = 9 \qquad \sqrt{D} = 3$$

$$y_{1,2} = \frac{-1 \pm 3}{4} = \left\langle \begin{matrix} \frac{1}{2} \\ -1 \end{matrix} \right.$$

$$\boxed{S:} \Rightarrow \quad \sin x = \frac{1}{2} \quad \vee \quad \sin x = -1$$

$$I. \quad x_1 = \tfrac{\pi}{6} + 2k\pi \qquad x_3 = \tfrac{3}{2}\pi + 2k\pi$$

$$II. \quad x_2 = \tfrac{5}{6}\pi + 2k\pi$$

$$\mathbf{K} = \{\tfrac{\pi}{6} + 2\mathbf{k}\pi;\ \tfrac{5}{6}\pi + 2\mathbf{k}\pi;\ \tfrac{3}{2}\pi + 2\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

27.

$$\begin{aligned} \sin^2 x - \cos^2 x + \sin x &= 0 \\ \sin^2 x - 1 + \sin^2 x + \sin x &= 0 \\ 2\sin^2 x + \sin x - 1 &= 0 \qquad S: \boxed{\sin x = y} \\ \Rightarrow \quad 2y^2 + y - 1 &= 0 \end{aligned}$$

$$D = 1 + 8 = 9 \qquad \sqrt{D} = 3$$

$$y_{1,2} = \frac{-1 \pm 3}{4} = \left\langle \begin{matrix} \frac{1}{2} \\ -1 \end{matrix} \right.$$

$$\boxed{S:} \Rightarrow \quad \sin x = \frac{1}{2} \quad \vee \quad \sin x = -1$$

$$I. \quad x_1 = \tfrac{\pi}{6} + 2k\pi \qquad x_3 = \tfrac{3}{2}\pi + 2k\pi$$

$$II. \quad x_2 = \tfrac{5}{6}\pi + 2k\pi$$

$$\mathbf{K} = \{\tfrac{\pi}{6} + 2\mathbf{k}\pi;\ \tfrac{5}{6}\pi + 2\mathbf{k}\pi;\ \tfrac{3}{2}\pi + 2\mathbf{k}\pi;\ \mathbf{k} \in \mathcal{Z}\}$$

28.

$$\begin{aligned} 4\cos^2 x + 5\sin x - 7 &= 0 \\ 4\left(1 - \sin^2 x\right) + 5\sin x - 7 &= 0 \qquad /\cdot(-1) \\ 4\sin^2 x - 5\sin x + 3 &= 0 \qquad S: \boxed{\sin x = y} \\ \Rightarrow \quad 4y^2 - 5y + 3 &= 0 \end{aligned}$$

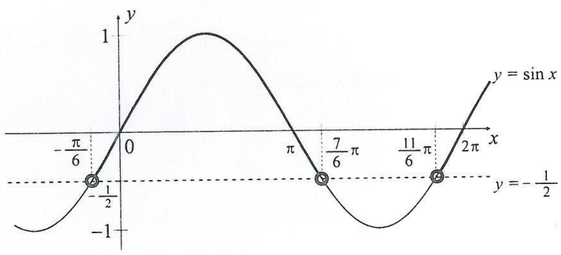
$$D = 25 - 48 = -23 \ < 0!$$

$$\mathbf{K} = \emptyset$$

29.

$$\sin x > -\tfrac{1}{2}$$

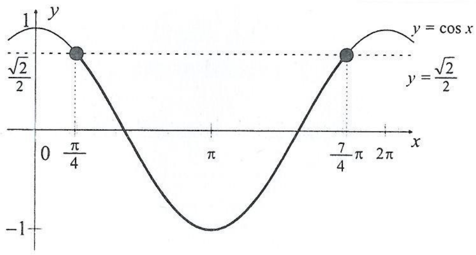
$$\mathbf{K} = \bigcup_{\mathbf{k} \in \mathcal{Z}} \left(-\tfrac{\pi}{6} + 2\mathbf{k}\pi;\ \tfrac{7}{6}\pi + 2\mathbf{k}\pi\right)$$



30.

$$\cos x \le \tfrac{\sqrt{2}}{2}$$

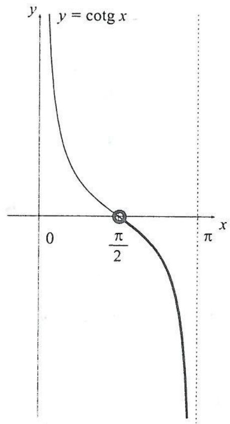
$$\mathbf{K} = \bigcup_{\mathbf{k} \in \mathcal{Z}} \left\langle \tfrac{\pi}{4} + 2\mathbf{k}\pi;\ \tfrac{7}{4}\pi + 2\mathbf{k}\pi \right\rangle$$



31.

$$\operatorname{cotg} x < 0 \qquad \mathcal{D}: \boxed{x \neq k\pi}$$

$$\mathbf{K} = \bigcup_{\mathbf{k} \in \mathcal{Z}} \left(\tfrac{\pi}{2} + \mathbf{k}\pi;\ \pi + \mathbf{k}\pi\right)$$



32.

$$\sin 2x \le -\tfrac{\sqrt{2}}{2} \qquad S: \boxed{2x = z}$$

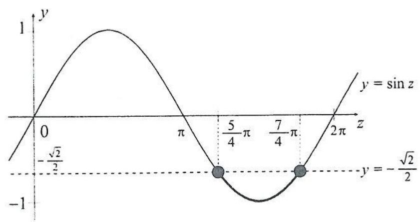
$$\Rightarrow \quad \sin z \le -\tfrac{\sqrt{2}}{2}$$

$$z \in \bigcup_{k \in \mathcal{Z}} \left\langle \tfrac{5}{4}\pi + 2k\pi;\ \tfrac{7}{4}\pi + 2k\pi \right\rangle$$

$$\boxed{S:} \Rightarrow \quad 2x \in \bigcup_{k \in \mathcal{Z}} \left\langle \tfrac{5}{4}\pi + 2k\pi;\ \tfrac{7}{4}\pi + 2k\pi \right\rangle$$

$$x \in \bigcup_{k \in \mathcal{Z}} \left\langle \tfrac{5}{8}\pi + k\pi;\ \tfrac{7}{8}\pi + k\pi \right\rangle$$

$$\mathbf{K} = \bigcup_{\mathbf{k} \in \mathcal{Z}} \left\langle \tfrac{5}{8}\pi + \mathbf{k}\pi;\ \tfrac{7}{8}\pi + \mathbf{k}\pi \right\rangle$$



33.

$$\cos \tfrac{x}{2} > -\tfrac{\sqrt{3}}{2}$$

$$\Rightarrow \quad \cos z > -\tfrac{\sqrt{3}}{2}$$

$$z \in \bigcup_{k \in \mathcal{Z}} \left(-\tfrac{5}{6}\pi + 2k\pi;\ \tfrac{5}{6}\pi + 2k\pi\right)$$

$$\boxed{S:} \Rightarrow \quad \tfrac{x}{2} \in \bigcup_{k \in \mathcal{Z}} \left(-\tfrac{5}{6}\pi + 2k\pi;\ \tfrac{5}{6}\pi + 2k\pi\right)$$

$$x \in \bigcup_{k \in \mathcal{Z}} \left(-\tfrac{5}{3}\pi + 4k\pi;\ \tfrac{5}{3}\pi + 4k\pi\right)$$

$$\mathbf{K} = \bigcup_{\mathbf{k} \in \mathcal{Z}} \left(-\tfrac{5}{3}\pi + 4\mathbf{k}\pi;\ \tfrac{5}{3}\pi + 4\mathbf{k}\pi\right)$$

34.

$$\sin \tfrac{x}{2} < \tfrac{\sqrt{3}}{2} \qquad S: \boxed{\tfrac{x}{2} = z}$$

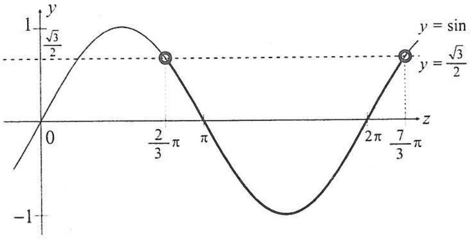
$$\Rightarrow \quad \sin z < \tfrac{\sqrt{3}}{2}$$

$$z \in \bigcup_{k \in \mathcal{Z}} \left(\tfrac{2}{3}\pi + 2k\pi;\ \tfrac{7}{3}\pi + 2k\pi\right)$$

$$\boxed{S:} \Rightarrow \quad \tfrac{x}{2} \in \bigcup_{k \in \mathcal{Z}} \left(\tfrac{2}{3}\pi + 2k\pi;\ \tfrac{7}{3}\pi + 2k\pi\right)$$

$$x \in \bigcup_{k \in \mathcal{Z}} \left(\tfrac{4}{3}\pi + 4k\pi;\ \tfrac{14}{3}\pi + 4k\pi\right)$$

$$\mathbf{K} = \bigcup_{\mathbf{k} \in \mathcal{Z}} \left(\tfrac{4}{3}\pi + 4\mathbf{k}\pi;\ \tfrac{14}{3}\pi + 4\mathbf{k}\pi\right)$$



$$S: \boxed{\tfrac{x}{2} = z}$$