

$$\textcircled{1} \csc \beta = \boxed{-\frac{6}{5}}$$

$$\textcircled{2} \sec \theta = \frac{8}{1}$$

$$\cos \theta = \frac{x}{r} = \frac{1}{8}$$

$$\tan \theta = \frac{3\sqrt{7}}{1} \frac{y}{x}$$

$$\sin \theta = \frac{y}{r}$$

$$\csc \theta = \frac{r}{y}$$

$$\csc \theta = \frac{8 \cdot \sqrt{7}}{3\sqrt{7} \cdot \sqrt{7}}$$

$$\boxed{\csc \theta = \frac{8\sqrt{7}}{21}}$$

$$\textcircled{3} \sec \theta = 4$$

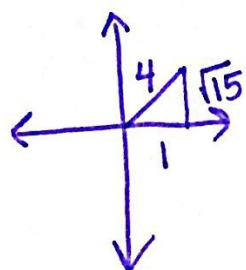
$$\cos \theta = \frac{1}{4} \frac{x}{r}$$

$$\tan \theta = \frac{y}{x} = \sqrt{15}$$

$$\sin \theta = \frac{y}{r} = \frac{\sqrt{15}}{4}$$

$$\textcircled{4} \cos \theta = -\frac{1}{4} \frac{x}{r} \quad \sin < 0$$

$$(-)$$

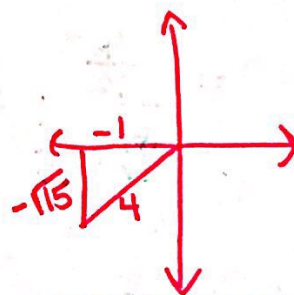


$$1^2 + y^2 = 4^2$$

$$1 + y^2 = 16$$

$$\sqrt{y^2} = \sqrt{15}$$

$$y = \sqrt{15}$$



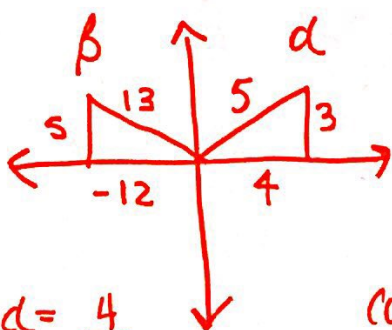
$$\tan \theta = \frac{y}{x} = \frac{-\sqrt{15}}{-1} = \sqrt{15}$$

$$\csc \theta = \frac{r}{y} = \frac{4}{-\sqrt{15}} = -\frac{4\sqrt{15}}{15}$$

5-12

$$\tan d = \frac{3}{4} \frac{y}{x}$$

$$\sin \beta = \frac{5}{13} \frac{y}{r}$$



$$\cos d = \frac{4}{5}$$

$$\cos \beta = -\frac{12}{13}$$

$$\sin d = \frac{3}{5}$$

$$\tan \beta = -\frac{5}{12}$$

$$\textcircled{5} \sin(d + \beta)$$

$$= \sin d \cos \beta + \cos d \sin \beta$$

$$= \left(\frac{3}{5}\right)\left(-\frac{12}{13}\right) + \left(\frac{4}{5}\right)\left(\frac{5}{13}\right)$$

$$= -\frac{36}{65} + \frac{20}{65}$$

$$= \boxed{-\frac{16}{65}}$$

$$\begin{aligned}
 \textcircled{6} \quad \cos(\alpha - \beta) &= \cos \alpha \cos \beta + \sin \alpha \sin \beta \\
 &= \left(\frac{4}{5}\right)\left(-\frac{12}{13}\right) + \left(\frac{3}{5}\right)\left(\frac{5}{13}\right) \\
 &= \frac{-48}{65} + \frac{15}{65} \\
 &= \boxed{\frac{-33}{65}}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{7} \quad \tan(\alpha + \beta) &= \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta} = \frac{\frac{3}{4} + \left(-\frac{5}{12}\right)}{1 - \left(\frac{3}{4}\right)\left(-\frac{5}{12}\right)} = \frac{\frac{9}{12} + \frac{-5}{12}}{1 + \frac{5}{16}} \\
 &= \frac{\frac{4}{12}}{\frac{16}{16} + \frac{5}{16}} = \frac{\frac{1}{3}}{\frac{21}{16}} = \frac{1}{3} \cdot \frac{16}{21} = \boxed{\frac{16}{63}}
 \end{aligned}$$

$$\textcircled{8} \quad \sin 2\beta = 2 \sin \beta \cos \beta = 2\left(\frac{5}{13}\right)\left(-\frac{12}{13}\right) = \boxed{\frac{-120}{169}}$$

$$\textcircled{9} \quad \cos 2\alpha = \cos^2 \alpha - \sin^2 \alpha = \left(\frac{4}{5}\right)^2 - \left(\frac{3}{5}\right)^2 = \frac{16}{25} - \frac{9}{25} = \boxed{\frac{7}{25}}$$

$$\begin{aligned}
 \textcircled{10} \quad \tan 2\beta &= \frac{2 \tan \beta}{1 - \tan^2 \beta} = \frac{2\left(-\frac{5}{12}\right)}{1 - \left(-\frac{5}{12}\right)^2} = \frac{-\frac{5}{6}}{1 - \frac{25}{144}} = \frac{-\frac{5}{6}}{\frac{144}{144} - \frac{25}{144}} = \frac{-\frac{5}{6}}{\frac{119}{144}} \\
 &= -\frac{5}{6} \cdot \frac{144}{119} = \boxed{\frac{-120}{119}}
 \end{aligned}$$

$$\textcircled{11} \quad \sin\left(\frac{5\pi}{6} - \frac{\pi}{3}\right) = \sin\left(\frac{3\pi}{6}\right) = \sin\left(\frac{\pi}{2}\right) = \boxed{1}$$

$$\textcircled{12} \quad \tan\left(\frac{\pi}{3} - \frac{3\pi}{2}\right) = \tan\left(\frac{2\pi}{6} - \frac{9\pi}{6}\right) = \tan\left(-\frac{7\pi}{6}\right) = \boxed{\frac{-\sqrt{3}}{3}}$$

$$\textcircled{13} \quad \sin(128 - 83) = \sin(45) = \boxed{\frac{\sqrt{2}}{2}}$$

$$(14) \cos(176 - 116) = \cos(60) = \boxed{\frac{1}{2}}$$

$$(15) \sin \frac{\pi}{12} = \sin\left(\frac{4\pi}{12} - \frac{3\pi}{12}\right) = \sin\left(\frac{\pi}{3} - \frac{\pi}{4}\right)$$

$$= \sin \frac{\pi}{3} \cos \frac{\pi}{4} - \cos \frac{\pi}{3} \sin \frac{\pi}{4}$$

$$= \frac{\sqrt{3}}{2} \left(\frac{\sqrt{2}}{2}\right) - \left(\frac{1}{2}\right) \left(\frac{\sqrt{2}}{2}\right)$$

$$= \frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4}$$

$$= \boxed{\frac{\sqrt{6} - \sqrt{2}}{4}}$$

$$(16) \tan 105 = \tan(60 + 45) = \frac{\tan 60 + \tan 45}{1 - \tan 60 \tan 45} = \frac{\sqrt{3} + 1}{1 - (\sqrt{3})(1)} = \frac{\sqrt{3} + 1}{1 - \sqrt{3}}$$

$$= \frac{\sqrt{3} + 1 \cdot (1 + \sqrt{3})}{1 - \sqrt{3} \cdot (1 + \sqrt{3})} = \frac{\sqrt{3} + 3 + 1 + \sqrt{3}}{1 - 3} = \frac{4 + 2\sqrt{3}}{-2} = \boxed{-2 - \sqrt{3}}$$

$$(17) \sec^2 \theta (1 - \cos^2 \theta)$$

$$\sec^2 \theta (\sin^2 \theta)$$

$$\frac{1}{\cos^2 \theta} \cdot \sin^2 \theta$$

$$\frac{\sin^2 \theta}{\cos^2 \theta}$$

$$\boxed{\tan^2 \theta}$$

$$(18) \frac{(\sec x - 1)}{(\sec x + 1)} \frac{1}{\sec x + 1} + \frac{1}{\sec x - 1} \frac{(\sec x + 1)}{(\sec x + 1)}$$

$$\frac{\sec x - 1}{\sec^2 x - 1} + \frac{\sec x + 1}{\sec^2 x - 1}$$

$$\frac{2 \sec x}{\sec^2 x - 1}$$

$$\frac{2 \sec x}{\tan^2 x}$$

$$\frac{2}{\frac{\cos x}{\sin^2 x} \cos x} = \frac{2}{\cos x} \cdot \frac{\cos^2 x}{\sin^2 x} = \frac{2 \cos x}{\sin^2 x} = \frac{2}{\sin x} \cdot \frac{\cos x}{\sin x} = \boxed{2 \csc x \cot x}$$

$$(19) \tan \theta - \frac{\sec^2 \theta}{\tan \theta}$$

$$\frac{\tan^2 \theta}{\tan \theta} - \frac{\sec^2 \theta}{\tan \theta}$$

$$\frac{\tan^2 \theta - \sec^2 \theta}{\tan \theta}$$

$$\frac{\tan^2 \theta - (\tan^2 \theta + 1)}{\tan \theta}$$

$$\frac{\tan^2 \theta - \tan^2 \theta - 1}{\tan \theta}$$

$$\frac{-1}{\tan \theta}$$

$$\boxed{-\cot \theta}$$

$$(22) \frac{(\sin \theta)}{(\sin \theta)} \frac{\sin \theta}{1 - \cos \theta} + \frac{1 - \cos \theta}{\sin \theta} \frac{(1 - \cos \theta)}{(1 - \cos \theta)}$$

$$\frac{\sin^2 \theta}{\sin \theta (1 - \cos \theta)} + \frac{1 - 2 \cos \theta + \cos^2 \theta}{\sin \theta (1 - \cos \theta)}$$

$$\frac{\sin^2 \theta + \cos^2 \theta + 1 - 2 \cos \theta}{\sin \theta (1 - \cos \theta)}$$

$$\frac{1 + 1 - 2 \cos \theta}{\sin \theta (1 - \cos \theta)}$$

$$\frac{2 - 2 \cos \theta}{\sin \theta (1 - \cos \theta)}$$

$$\frac{2(1 - \cos \theta)}{\sin \theta (1 - \cos \theta)}$$

$$\frac{2}{\sin \theta} = \boxed{2 \csc \theta}$$

$$(20) \csc \theta - \cos \theta \cot \theta$$

$$\frac{1}{\sin \theta} - \cos \theta \left(\frac{\cos \theta}{\sin \theta} \right)$$

$$\frac{1}{\sin \theta} - \frac{\cos^2 \theta}{\sin \theta}$$

$$\frac{1 - \cos^2 \theta}{\sin \theta}$$

$$\frac{\sin^2 \theta}{\sin \theta}$$

$$\boxed{\sin \theta}$$

$$(21) \tan \theta (\csc^2 \theta - \tan \theta)$$

$$\tan \theta (\csc^2 \theta - 1)$$

$$\tan \theta (\cot^2 \theta)$$

$$\frac{1}{\cot \theta} (\cot^2 \theta)$$

$$\boxed{\cot \theta}$$

$$(23) (\csc x - \cot x)(\csc x + \cot x)$$

$$\csc^2 x + \csc x \cot x - \csc x \cot x - \cot^2 x$$

$$\csc^2 x - \cot^2 x$$

$$\cot^2 x + 1 - \cot^2 x$$

$$\boxed{1}$$

$$(24) \frac{(1-\cot^2 x)}{(1-\cot^2 x)(1-\tan^2 x)} + \frac{1}{1-\cot^2 x} \frac{(1-\tan^2 x)}{(1-\tan^2 x)}$$

$$\frac{1-\cot^2 x}{1-\tan^2 x - \cot^2 x + \cot^2 x \tan^2 x} + \frac{1-\tan^2 x}{1-\tan^2 x - \cot^2 x + \cot^2 x \tan^2 x}$$

$$\frac{2 - \cot^2 x - \tan^2 x}{1 - \tan^2 x - \cot^2 x + \cot^2 x \left(\frac{1}{\cot^2 x}\right)}$$

$$\frac{2 - \cot^2 x - \tan^2 x}{1 - \tan^2 x - \cot^2 x + 1}$$

$$\frac{2 - \cot^2 x - \tan^2 x}{2 - \cot^2 x - \tan^2 x}$$

1

$$(25) \frac{\sin^2 x}{1 - \cos x}$$

$$\frac{1 - \cos^2 x}{1 - \cos x}$$

$$\frac{(1 + \cos x)(1 - \cos x)}{1 - \cos x}$$

1 + \cos x

$$(26) \sin x + \frac{\cos x}{\tan x}$$

$$\sin x + \frac{\cos x}{\frac{\sin x}{\cos x}}$$

$$\sin x + \cos x \cdot \frac{\cos x}{\sin x}$$

$$\sin x + \frac{\cos^2 x}{\sin x}$$

$$\frac{\sin^2 x}{\sin x} + \frac{\cos^2 x}{\sin x}$$

$$\frac{\sin^2 x + \cos^2 x}{\sin x}$$

$$\frac{1}{\sin x}$$

\csc x

$$(27) \frac{\cos(-x)}{\cot(-x)}$$

$$\frac{\cos x}{-\cot x}$$

$$\frac{\cos x}{-\frac{\cos x}{\sin x}}$$

$$\cancel{\cos x} \cdot \frac{-\sin x}{\cancel{\cos x}}$$

-\sin x

$$\textcircled{28} \frac{-\csc(-x)}{-\sec(x)}$$

$$\frac{-(-\csc x)}{-\sec x}$$

$$\frac{\csc x}{-\sec x}$$

$$\frac{1}{\sin x}$$

$$-\frac{1}{\cos x}$$

$$\frac{1}{\sin x} \cdot -\frac{\cos x}{1}$$

$$-\frac{\cos x}{\sin x}$$

$$\boxed{-\cot x}$$

$$\textcircled{29} \csc^2\left(\frac{\pi}{2} - \theta\right) - 1$$

$$\sec^2 \theta - 1$$

$$\boxed{\tan^2 \theta}$$

$$\textcircled{30} 1 - \cos^2\left(\frac{\pi}{2} - \beta\right)$$

$$1 - \sin^2 \beta$$

$$\boxed{\cos^2 \beta}$$

$$\textcircled{31} 2\sin x + 1 = 0$$

$$2\sin x = -1$$

$$\sin x = -\frac{1}{2}$$

$$\boxed{x = \frac{7\pi}{6}, \frac{11\pi}{6}}$$

$$\textcircled{32} \sqrt{3} \sec x - 2 = 0$$

$$\sqrt{3} \sec x = 2$$

$$\sec x = \frac{2}{\sqrt{3}}$$

$$\cos x = \frac{\sqrt{3}}{2}$$

$$\boxed{x = \frac{\pi}{6}, \frac{11\pi}{6}}$$

$$\textcircled{33} 4 \sec x + 2\sqrt{3} = \sec x$$

$$3 \sec x + 2\sqrt{3} = 0$$

$$3 \sec x = -2\sqrt{3}$$

$$\sec x = \frac{-2\sqrt{3}}{3}$$

$$\cos x = \frac{-3 \cdot \sqrt{3}}{2\sqrt{3} \cdot \sqrt{3}}$$

$$\cos x = \frac{-3\sqrt{3}}{6} = -\frac{\sqrt{3}}{2}$$

$$\boxed{x = \frac{5\pi}{6}, \frac{7\pi}{6}}$$

$$\textcircled{34} 3\sin^2 x + 6 = 2\sin^2 x + 7$$

$$\sqrt{\sin^2 x} = \sqrt{1}$$

$$\sin x = \pm 1$$

$$\boxed{x = \frac{\pi}{2}, \frac{3\pi}{2}}$$

$$\textcircled{35} 3 \cot^2 x = 1$$

$$\cot^2 x = \frac{1}{3}$$

$$\sqrt{\tan^2 x} = \sqrt{3}$$

$$\tan x = \pm\sqrt{3}$$

$$\boxed{x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}}$$

$$(36) 4\cos^2 x + 2 = 3$$

$$4\cos^2 x = 1$$
$$\sqrt{\cos^2 x} = \sqrt{\frac{1}{4}}$$

$$\cos x = \pm \frac{1}{2}$$

$$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$$

$$(37) 4\cos^2 x - 3 = 0$$

$$4\cos^2 x = 3$$

$$\sqrt{\cos^2 x} = \sqrt{\frac{3}{4}}$$

$$\cos x = \pm \frac{\sqrt{3}}{2}$$

$$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$(38) \cos^2 x - \cos x = 0$$

$$\cos x (\cos x - 1) = 0$$

$$\cos x = 0 \quad \cos x - 1 = 0$$
$$\cos x = 1$$

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

$$(39) 2\cos^2 x - 9\cos x = 5$$

$$2\cos^2 x - 9\cos x - 5 = 0$$

$$\begin{array}{r} -10 \\ \times 1 \\ -9 \end{array} (2\cos^2 x - 10\cos x) + (\cos x - 5) = 0$$

$$2\cos x (\cos x - 5) + 1(\cos x - 5) = 0$$

$$(\cos x - 5)(2\cos x + 1) = 0$$

$$\cos x - 5 = 0$$

$$\cos x = 5$$

$$2\cos x + 1 = 0$$

$$2\cos x = -1$$

$$\cos x = -\frac{1}{2}$$

$$x = \frac{2\pi}{3}, \frac{4\pi}{3}$$

$$(40) 5\sec^2 x - 20 = 0$$

$$5\sec^2 x = 20$$

$$\sec^2 x = 4$$

$$\sqrt{\cos^2 x} = \sqrt{\frac{1}{4}}$$

$$\cos x = \pm \frac{1}{2}$$

$$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$$

$$(41) \quad 2\sin^2 x = 2 + \cos x$$

$$2(1 - \cos^2 x) = 2 + \cos x$$

$$2 - 2\cos^2 x = 2 + \cos x$$

$$0 = 2\cos^2 x + \cos x$$

$$0 = \cos x (2\cos x + 1)$$

$$\cos x = 0 \quad 2\cos x + 1 = 0$$

$$\cos x = -\frac{1}{2}$$

$$X = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{2\pi}{3}, \frac{4\pi}{3}$$

$$(42) \quad \sin^2 x = 3\cos^2 x$$

$$1 - \cos^2 x = 3\cos^2 x$$

$$1 = 4\cos^2 x$$

$$\sqrt{\frac{1}{4}} = \sqrt{\cos^2 x}$$

$$\pm \frac{1}{2} = \cos x$$

$$X = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$$

$$(43) \quad \sec^2 x - 2\tan x = 4$$

$$\tan^2 x + 1 - 2\tan x = 4$$

$$\tan^2 x - 2\tan x - 3 = 0$$

$$(\tan x - 3)(\tan x + 1) = 0$$

$$\tan x - 3 = 0 \quad \tan x + 1 = 0$$

$$\tan x = 3 \quad \tan x = -1$$

$$X = \frac{3\pi}{4}, \frac{7\pi}{4}$$

$$(44) \quad \sec x + \tan x = 0$$

$$\frac{1}{\cos x} + \frac{\sin x}{\cos x} = 0$$

$$\cos x \cdot \frac{1 + \sin x}{\cos x} = 0 \cdot \cos x$$

$$1 + \sin x = 0$$

$$\sin x = -1$$

$$X = \frac{3\pi}{2}$$

$$N.S.$$

$$\begin{aligned} (45) \quad \sin x + \cos x &= 0 \\ (\sin x)^2 &= (-\cos x)^2 \\ \sin^2 x &= \cos^2 x \\ 1 - \cos^2 x &= \cos^2 x \\ 1 &= 2\cos^2 x \\ \sqrt{\frac{1}{2}} &= \sqrt{\cos^2 x} \\ \pm \frac{1}{\sqrt{2}} &= \cos x \\ \pm \frac{\sqrt{2}}{2} &= \cos x \end{aligned}$$

$$x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

$$\begin{aligned} (46) \quad \sec x - 2\tan x &= 0 \\ (\sec x)^2 &= (2\tan x)^2 \\ \sec^2 x &= 4\tan^2 x \\ \tan^2 x + 1 &= 4\tan^2 x \\ 1 &= 3\tan^2 x \\ \sqrt{\frac{1}{3}} &= \sqrt{\tan^2 x} \\ \pm \frac{1}{\sqrt{3}} &= \tan x \\ \pm \frac{\sqrt{3}}{3} &= \tan x \end{aligned}$$

$$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$\begin{aligned} (47) \quad \sec^2 x + \tan x - 3 &= 0 \\ \tan^2 x + 1 + \tan x - 3 &= 0 \\ \tan^2 x + \tan x - 2 &= 0 \\ (\tan x + 2)(\tan x - 1) &= 0 \\ \tan x + 2 = 0 \quad \tan x - 1 = 0 \\ \tan x = -2 \quad \tan x = 1 \end{aligned}$$

$$x = \frac{\pi}{4}, \frac{5\pi}{4}$$

$$\begin{aligned} (48) \quad \sec x \csc x &= 2 \csc x \\ \sec x (\csc x - 2 \csc x) &= 0 \\ \csc x (\sec x - 2) &= 0 \\ \csc x = 0 \quad \sec x - 2 = 0 \\ \sin x = \frac{1}{0} \quad \sec x = 2 \\ \text{Undefined} \quad \cos x = \frac{1}{2} \end{aligned}$$

$$x = \frac{\pi}{3}, \frac{5\pi}{3}$$

$$(49) \quad \frac{\cos \theta (1 - \sin \theta)}{\cos \theta} = \cos \theta \cdot \cos \theta$$

$$\begin{aligned} 1 - \sin \theta &= \cos^2 \theta \\ 1 - \sin \theta &= 1 - \sin^2 \theta \\ \sin^2 \theta - \sin \theta &= 0 \\ \sin \theta (\sin \theta - 1) &= 0 \\ \sin \theta = 0 \quad \sin \theta - 1 = 0 \\ \sin \theta &= 1 \end{aligned}$$

$$\theta = 0\pi, \pi, \frac{\pi}{2}$$

$$(50) \frac{(\sec\theta+1)}{(\sec\theta+1)\sec\theta-1} - \frac{1}{\sec\theta+1} \frac{(\sec\theta-1)}{(\sec\theta-1)} = 2$$

$$\frac{\sec\theta+1}{\sec^2\theta-1} - \frac{\sec\theta-1}{\sec^2\theta-1} = 2$$

$$\frac{2}{\sec^2\theta-1} = 2$$

$$\frac{2}{\tan^2\theta} = 2$$

$$2 = 2\tan^2\theta$$

$$\sqrt{1} = \sqrt{\tan^2\theta}$$

$$\pm 1 = \tan\theta$$

$$\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

$$(52) \sec 4x = 2 \quad 0 \leq 4x < 8\pi$$

$$\cos 4x = \frac{1}{2} \quad \text{Add } \frac{6\pi}{3}$$

$$4x = \frac{\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{11\pi}{3}, \frac{13\pi}{3}, \frac{17\pi}{3}, \frac{19\pi}{3}, \frac{23\pi}{3}$$

$$x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{7\pi}{12}, \frac{11\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}, \frac{19\pi}{12}, \frac{23\pi}{12}$$

$$(54) 3\tan\frac{\theta}{2} + 3 = 0$$

$$3\tan\frac{\theta}{2} = -3$$

$$\tan\frac{\theta}{2} = -1$$

$$0 \leq \frac{\theta}{2} < \pi$$

$$\frac{\theta}{2} = \frac{3\pi}{4} \cdot 2$$

$$\theta = \frac{3\pi}{2}$$

$$(51) \sqrt{\tan^2 3x} = \sqrt{3}$$

$$\tan 3x = \pm\sqrt{3}$$

$$0 \leq 3x < 6\pi$$

$$\text{Add } \frac{6\pi}{3}$$

$$3x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{8\pi}{3}, \frac{10\pi}{3}, \frac{11\pi}{3}$$

$$\frac{13\pi}{3}, \frac{14\pi}{3}, \frac{16\pi}{3}, \frac{17\pi}{3}$$

$$x = \frac{\pi}{9}, \frac{2\pi}{9}, \frac{4\pi}{9}, \frac{5\pi}{9}, \frac{7\pi}{9}, \frac{8\pi}{9}, \frac{10\pi}{9}, \frac{11\pi}{9}, \frac{13\pi}{9}, \frac{14\pi}{9}, \frac{16\pi}{9}, \frac{17\pi}{9}$$

$$(53) 2\cos 3x - 1 = 0 \quad 0 \leq 3x < 6\pi$$

$$2\cos 3x = 1$$

$$\cos 3x = \frac{1}{2}$$

$$\text{Add } \frac{6\pi}{3}$$

$$3x = \frac{\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{11\pi}{3}, \frac{13\pi}{3}, \frac{17\pi}{3}$$

$$\frac{19\pi}{3}, \frac{23\pi}{3}$$

$$x = \frac{\pi}{9}, \frac{5\pi}{9}, \frac{7\pi}{9}, \frac{11\pi}{9}, \frac{13\pi}{9}, \frac{17\pi}{9}$$