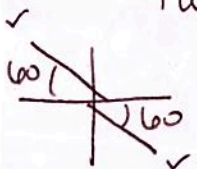


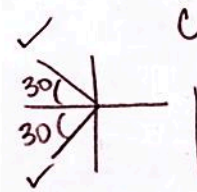
Find all solutions of the equation in the interval $[0, 2\pi)$. Use separate sheet of paper, if necessary.

1. $\tan\theta + \sqrt{3} = 0$
 $\tan\theta = -\sqrt{3}$



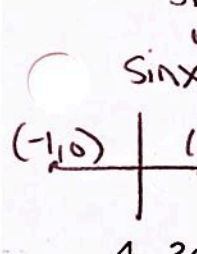
$\theta = \frac{2\pi}{3}, \frac{5\pi}{3}$

2. $2\cos\theta + \sqrt{3} = 0$
 $2\cos\theta = -\sqrt{3}$
 $\cos\theta = -\frac{\sqrt{3}}{2}$



$\theta = \frac{5\pi}{6}, \frac{7\pi}{6}$

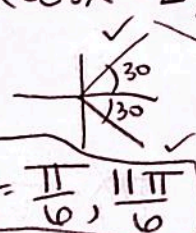
3. $2\sin^2 x + \sin x = 0$
 $\sin x(2\sin x + 1) = 0$



$\sin x = 0 \rightarrow x = 0, \pi$
 $2\sin x + 1 = 0 \rightarrow \sin x = -\frac{1}{2} \rightarrow x = \frac{7\pi}{6}, \frac{11\pi}{6}$

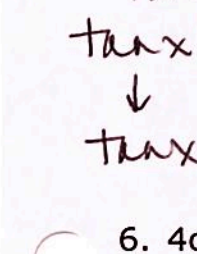
4. $2\cos^2 x - 5\cos x + 2 = 0$
 $(2\cos x - 1)(\cos x - 2) = 0$

$2\cos x - 1 = 0 \rightarrow \cos x = \frac{1}{2} \rightarrow x = \frac{\pi}{6}, \frac{11\pi}{6}$



$\cos x - 2 = 0 \rightarrow \cos x = 2$
 No Sol.

5. $\tan x \sec x = \tan x$
 $\tan x \sec x - \tan x = 0$
 $\tan x(\sec x - 1) = 0$



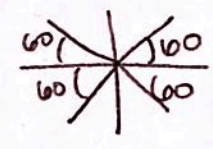
$\tan x = 0 \rightarrow x = 0, \pi$
 $\sec x - 1 = 0 \rightarrow \sec x = 1 \rightarrow \cos x = 1 \rightarrow x = 0, \pi$

6. $4\cos^2 x - 1 = 0$
 $4\cos^2 x = 1$
 $\cos^2 x = \frac{1}{4}$
 $\sqrt{\cos^2 x} = \pm \frac{1}{2}$
 $\cos x = \pm \frac{1}{2}$



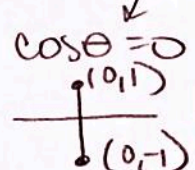
$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

7. $\frac{4\sin^2 x}{4} = \frac{3}{4}$
 $\sin^2 x = \frac{3}{4}$
 $\sqrt{\sin^2 x} = \pm \sqrt{\frac{3}{4}}$
 $\sin x = \pm \frac{\sqrt{3}}{2}$



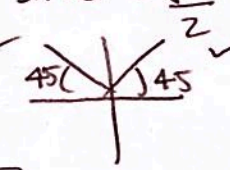
$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

8. $2\sin\theta \cos\theta = \sqrt{2} \cos\theta$
 $2\sin\theta \cos\theta - \sqrt{2} \cos\theta = 0$
 $\cos\theta(2\sin\theta - \sqrt{2}) = 0$



$\cos\theta = 0 \rightarrow \theta = \frac{\pi}{2}, \frac{3\pi}{2}$
 $2\sin\theta - \sqrt{2} = 0 \rightarrow 2\sin\theta = \sqrt{2} \rightarrow \sin\theta = \frac{\sqrt{2}}{2} \rightarrow \theta = \frac{\pi}{4}, \frac{3\pi}{4}$

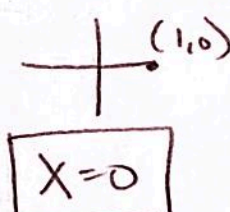
9. $\tan x - \sqrt{3} = 2\tan x$
 $-\tan x = \sqrt{3} \rightarrow \tan x = -\sqrt{3}$



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

10. $\frac{\cos x + 2}{-\cos x} = \frac{3\cos x}{-\cos x}$

$\frac{2\cos x}{2} = \frac{2}{2}$
 $\cos x = 1 \rightarrow x = 0$



11. $2\sin^2 x + 3\sin x + 1 = 6$
 $2\sin^2 x + 3\sin x - 5 = 0$
 $(2\sin x + 5)(\sin x - 1) = 0$
 $2\sin x + 5 = 0 \rightarrow \sin x = -\frac{5}{2}$ (No Sol.)
 $\sin x - 1 = 0 \rightarrow \sin x = 1 \rightarrow x = \frac{\pi}{2}$

12. $2\cos^2 x = 1$
 $\sqrt{\cos^2 x} = \pm \sqrt{\frac{1}{2}}$
 $\cos x = \pm \frac{\sqrt{2}}{2}$

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

13. $2\sec^2 x - 1 = 0$

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

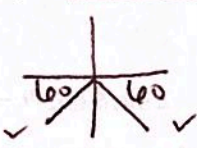
$$\sqrt{\sec^2 x} = \pm \frac{\sqrt{2}}{2}$$

$$\sec x = \pm \frac{\sqrt{2}}{2} \rightarrow \cos x = \pm \frac{2}{\sqrt{2}} \rightarrow \sqrt{2}$$

No Solution

14. $2\sin 2\theta + \sqrt{3} = 0$

$$\sin 2\theta = -\frac{\sqrt{3}}{2}$$



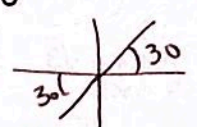
$$\frac{2\theta}{2} = \frac{4\pi}{3}, \frac{5\pi}{3}$$

→ Add New Period $\frac{2\pi}{2} = \pi$

$\theta = \frac{2\pi}{3}, \frac{5\pi}{6}, \frac{5\pi}{3}, \frac{11\pi}{6}$

15. $3\tan \frac{\theta}{2} - \sqrt{3} = 0$

$$\tan \frac{\theta}{2} = \frac{\sqrt{3}}{3} \rightarrow \frac{1}{\sqrt{3}}$$



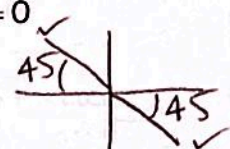
(2) $\frac{\theta}{2} = \frac{\pi}{6}, \frac{5\pi}{6}$

$\theta = \frac{\pi}{3}, \frac{5\pi}{3}$ → greater than 2π

16. $3\tan 2\theta + 3 = 0$

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

$$\tan 2\theta = -1$$



$$\frac{2\theta}{2} = \frac{3\pi}{4}, \frac{7\pi}{4}$$

→ add New Period $\frac{\pi}{2}$

$\theta = \frac{3\pi}{8}, \frac{7\pi}{8}, \frac{11\pi}{8}, \frac{15\pi}{8}$

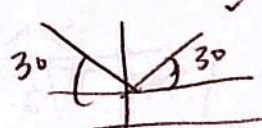
17. $2\sin^2 x - 7\sin x + 3 = 0$

$$(2\sin x - 1)(\sin x - 3) = 0$$

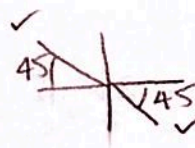
$$\sin x = \frac{1}{2}$$

$$\sin x = 3$$

No Sol.



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



18.

$$2\tan^2 x - (1 + \tan^2 x) + 3 = 1 - 2\tan x$$

$$2\tan^2 x - \sec^2 x + 3 = 1 - 2\tan x$$

$$\tan^2 x + 2\tan x + 1 = 0$$

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

$$\tan x + 1 = 0$$

$$\tan x = -1$$

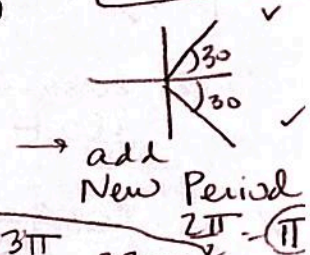
$x = \frac{3\pi}{4}, \frac{7\pi}{4}$

19.

$$2\cos(2x) - \sqrt{3} = 0$$

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

$$\frac{2x}{2} = \frac{\pi}{6}, \frac{11\pi}{6}$$



→ add New Period $\frac{2\pi}{2} = \pi$

$x = \frac{\pi}{12}, \frac{11\pi}{12}, \frac{13\pi}{12}, \frac{23\pi}{12}$

20.

$$3 - 3\sin x - 2\cos^2 x = 0$$

$$3 - 3\sin x - 2(1 - \sin^2 x) = 0$$

$$3 - 3\sin x - 2 + 2\sin^2 x = 0$$

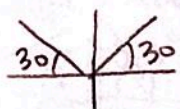
$$2\sin^2 x - 3\sin x + 1 = 0$$

$$(2\sin x - 1)(\sin x - 1) = 0$$

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

$$\sin x = 1$$

(0, 1)



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