

Solving Trig Equations

Solve for x .
Give all solutions

$$\textcircled{1} \sin x - 1 = 0$$

+1 +1

k is an integer

$$x - 1 = 0$$

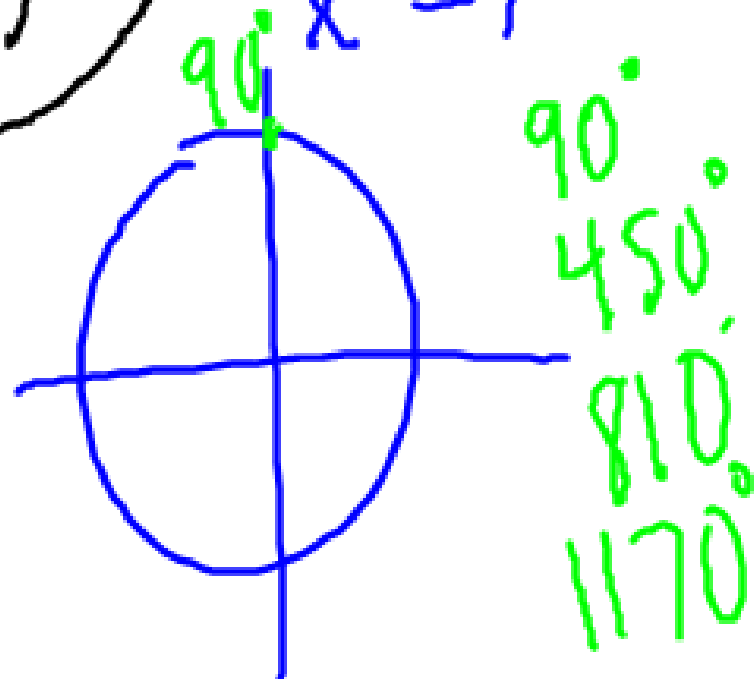
$$x = 1$$

$$\sin x = 1$$

$$x = 90^\circ, \pi/2$$

$$x = 90 + 360k$$

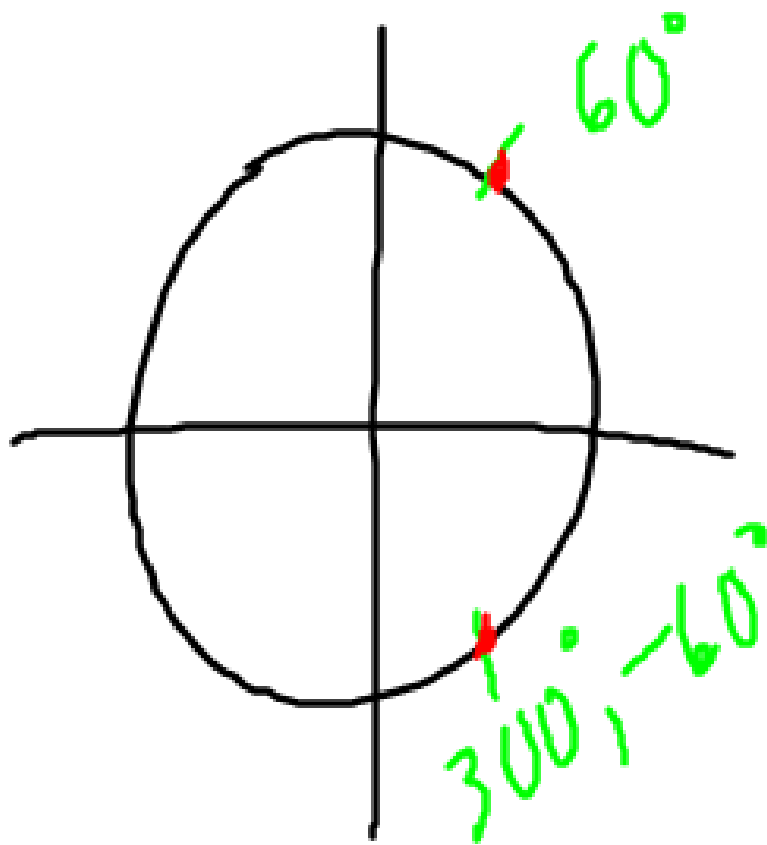
$$x = \frac{\pi}{2} + 2\pi k$$



$$\textcircled{3} \quad 2 \cos x - 1 = 0$$

$$2y - 1 = 0$$
$$y = \frac{1}{2}$$

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



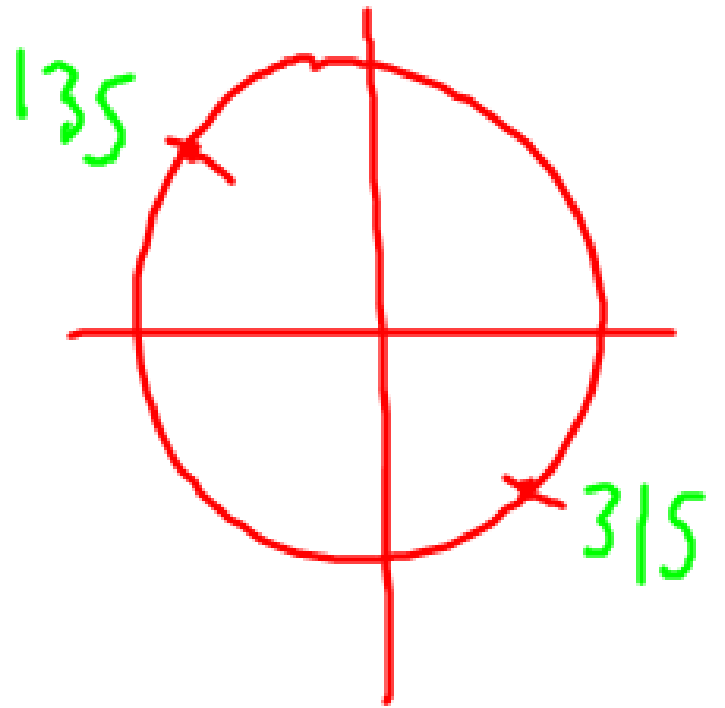
$$x = \pm 60 + 360K$$

$$x = \pm \frac{\pi}{3} + 2\pi K$$

$$\textcircled{6} \quad \tan x + 1 = 0$$
$$\tan x = -1$$

$$x = 135 + 180K$$

$$x = \frac{3}{4}\pi + \pi K$$

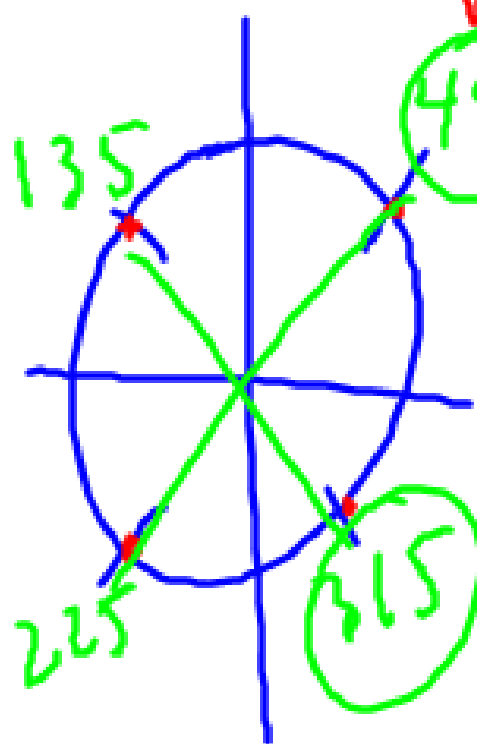


$$\textcircled{8} \quad 2 \cos^2 x - 1 = 0$$

$$2y^2 - 1 = 0$$

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

$$y^2 = \frac{1}{2}$$



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

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

$$x = \pm \frac{\pi}{4} + \pi k$$

$$y = \pm \frac{1}{\sqrt{2}}$$

$$\text{OR } y = \pm \frac{1}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}}$$

$$x = 45 + 90k$$

$$x = \frac{\pi}{4} + \frac{\pi k}{2}$$

$$y = \pm \frac{\sqrt{2}}{2}$$

⑨

$$\sec^2 x - 2 = 0$$

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

$$x = \frac{\pi}{4} + \frac{\pi}{2}k$$

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

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

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

4, 5, 7, 10

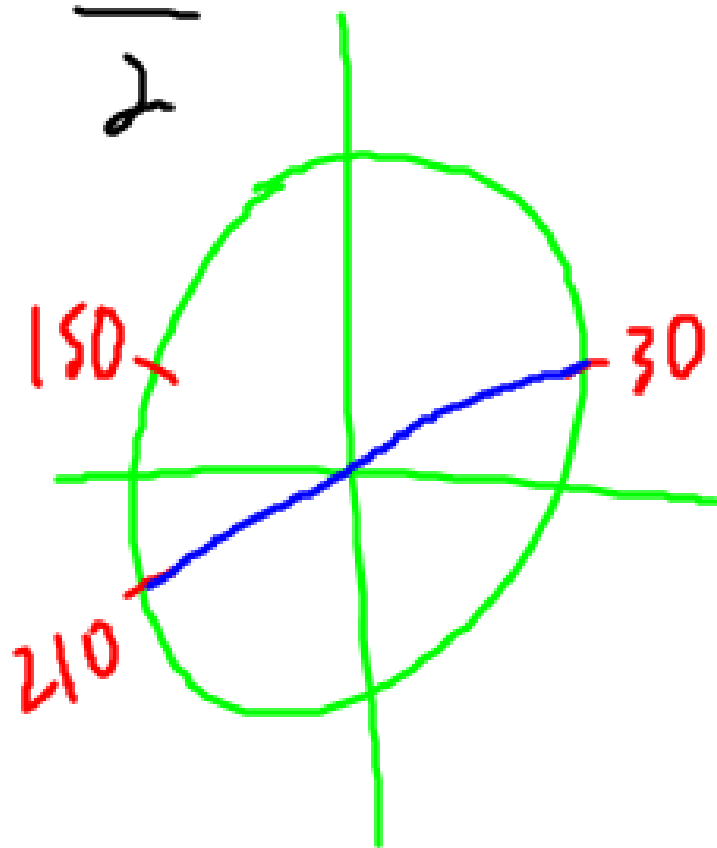
HW

$$\textcircled{14} (2\cos x + \sqrt{3})(2\sin x - 1) = 0$$

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

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

150, 210



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

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

30, 150

$$x = 30 + 180K$$

$$x = 150 + 360K$$

$$x = \frac{\pi}{6} + \pi K$$

$$x = \frac{5\pi}{6} + 2\pi K$$

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$$\underline{\underline{\cos x}} \sin x - 2 \underline{\underline{\cos x}} = 0$$

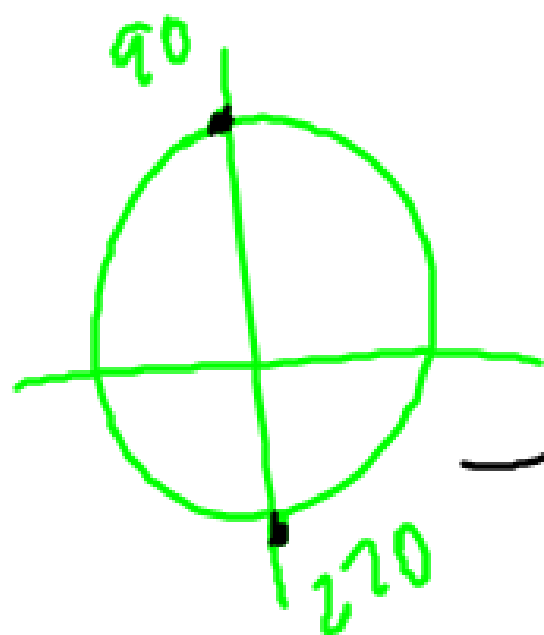
$$\cos x (\sin x - 2) = 0$$

↙
 $\cos x = 0$

$$\sin x - 2 = 0$$

$$\sin x = 2$$

no solutions



→ $x = 90 + 180K$

$$x = \frac{\pi}{2} + \pi K$$

$$\textcircled{22} \quad 2 \cos^2 x + \sin x = 1$$

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

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

$$\textcircled{2} \quad -2 \sin^2 x + \sin x - 1 = 0$$

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

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

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

$$y = \sin x$$

$$2y^2 - 1y - 1 = 0$$

$$(2y + 1)(y - 1) = 0$$

$$y = -\frac{1}{2}$$

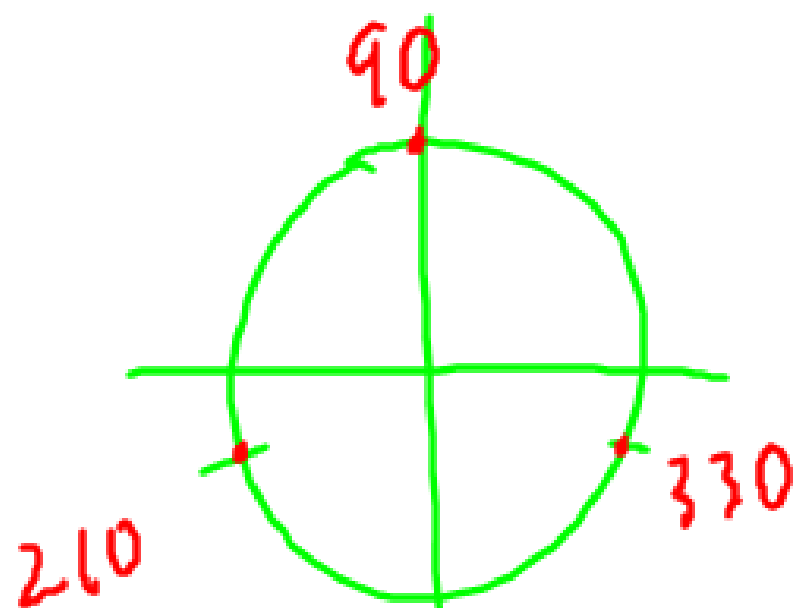
$$y = 1$$

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

$$210, 330$$

$$\sin x = 1$$

$$90$$



$$x = 30 + 120K$$

$$x = \frac{\pi}{6} + \frac{2}{3}\pi K$$

$$\textcircled{4} (2 \sin x \tan x - \tan x) + (2 \sin x - 1) = 0$$

$$\tan x (\underline{2 \sin x - 1}) + 1 (\underline{2 \sin x - 1}) = 0$$

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

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

$$\tan x = -1$$

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

$$\tan x = -1$$

30, 150

135, 315



135 + 180K

30 + 360K

150 + 360K

$$x = \frac{3}{4}\pi + \pi k$$

$$x = \frac{\pi}{6} + 2\pi k$$

$$x = \frac{5}{6}\pi + 2\pi k$$