

Dynamics of Trigonometry - Ruckdeschel

Any calculator; One page handwritten

Notes allowed

Name: Key - 2015
Date: _____
Block: _____

Review: Solving Trigonometric Equations

Show all work for credit!!!

Solve on the interval $0^\circ \leq x < 360^\circ$.

1. $2\sin x + 1 = 0$

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

$$x = 210^\circ, 330^\circ$$

2. $3\cot^2 x - 1 = 0$

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

$$\cot x = \pm \frac{\sqrt{3}}{3}$$

$$x = 60^\circ, 120^\circ, 240^\circ, 300^\circ$$

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

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

$$\cos x + 1 = 0$$

$$\cos x = 0$$

$$\cos x = -1$$

$$x = 90^\circ, 270^\circ$$

$$x = 180^\circ$$

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

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

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

$$\cos x + 1 = 0$$

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

$$\cos x = -1$$

$$x = 60^\circ, 300^\circ$$

$$x = 180^\circ$$

Solve on the interval $0 \leq x < 2\pi$.

5. $2 \cos x = 1 + 4 \cos x$

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

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

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

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

$$\sec^2 x = 2$$

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

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

7. $\frac{1}{2} \csc x - 1 = 0$

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

$$\csc x = 2$$

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

8. $\cot^2 x - \cot x = 0$

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

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

$$\cot x = 1$$

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

Solve for ALL the angles in radians for the following equations.

9. $4\cos^2 x - 3 = 0$

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

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

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

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

$$x = \frac{7\pi}{6} + 2\pi n$$

$$x = \frac{11\pi}{6} + 2\pi n$$

10. $\sin x = \sqrt{3} - \sin x$

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

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

$$x = \frac{\pi}{3} + 2\pi n$$

$$x = \frac{2\pi}{3} + 2\pi n$$

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

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

$$\sin x - 1 = 0$$

$$\sin x = 1$$

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

12. $\tan x = -1$

$$x = \frac{3\pi}{4} + 2\pi n$$

$$x = \frac{7\pi}{4} + 2\pi n$$