PROBLEMS AND SOLUTIONS - SOLVING TRIGONOMETRIC EQUATIONS - PART 2

Prepared by Ingrid Stewart, Ph.D., College of Southern Nevada
Please Send Questions and Comments to ingrid.stewart@csn.edu. Thank you!

PLEASE NOTE THAT YOU CANNOT ALWAYS USE A CALCULATOR ON THE ACCUPLACER - COLLEGE-LEVEL MATHEMATICS TEST! YOU MUST BE ABLE TO DO SOME PROBLEMS WITHOUT A CALCULATOR!

Problem 1:

Solve $2\cos x = -\sqrt{3}$ for x finding **ALL** possible solutions. Express your answer in **EXACT** radians AND in **EXACT** degrees.

Problem 2:

Solve $\tan x = -12.08$ for x finding ALL possible solutions. Express your answers in degrees.

Problem 3:

Solve $2\sin^2 x = 3\sin x - 1$ for x on the interval $[0°, 360°)$. Express your answers in degrees.

Problem 4:

Solve $2\cos^2 x + 3\sin x = 0$ for x on the interval $[0°, 360°)$. Express your answers in degrees.

Problem 5:

Solve $2\cos x + 2\sin x \cos x = 0$ for x finding ALL solutions. Express your answers in **EXACT** radians.

Problem 6:

Solve $\tan^2 x = 3$ for x on the interval $[0, 2\pi)$. Express your answers in **EXACT** radians.

Problem 7:

Solve $1-\sqrt{2}\cos(\frac{x}{2})=0$ for x on the interval $[0°,720°)$. Express your answers in degrees.

Problem 8:

Solve $2\cos 2x=-1$ for x on the interval $[0°,180°)$. Express your answers in degrees.

Problem 9:

Solve $2\sin 4x=1$ for x on the interval $[0,\pi)$. Express your answers in radians.

Problem 10:

Solve $2\tan\frac{x}{3}=-2$ for x on the interval $[0,6\pi)$. Express your answers in radians.

Problem 11:

Solve $\sin 3x=-1$ for x on the interval $\left[0,\frac{2\pi}{3}\right)$. Express your answers in radians.

Problem 12:

Solve $\cos 4x=0$ for x on the interval $\left[0,\frac{\pi}{2}\right)$. Express your answers in radians.

SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. $\frac{5\pi}{6}+2\pi k,\ \ \frac{7\pi}{6}+2\pi k$ $150^\circ+360^\circ k,\ \ 210^\circ+360^\circ k$ where k is any integer	2. $94.73^\circ+360^\circ k,\ \ 274.73^\circ+360^\circ k$ or $94.73^\circ+180^\circ k$ where k is any integer	3. $x_1 = 30^o$ $x_2 = 90^o$ $x_3 = 150^o$
4. $x_1 = 210^o$ $x_2 = 330^o$	5. $\frac{\pi}{2}+2\pi k$ and $\frac{3\pi}{2}+2\pi k$ where k is any integer	6. $x_1 = 60^\circ \equiv \frac{\pi}{3}$ $x_2 = 240^\circ \equiv \frac{4\pi}{3}$ $x_3 = 120^\circ \equiv \frac{2\pi}{3}$ $x_4 = 300^\circ \equiv \frac{5\pi}{3}$
7. $x_1 = 90^\circ$ $x_2 = 630^\circ$	8. $x_1 = 60^\circ$ $x_2 = 120^\circ$	9. $x_1 = \frac{\pi}{24}$ $x_2 = \frac{5\pi}{24}$ $x_3 = \frac{13\pi}{24}$ $x_4 = \frac{17\pi}{24}$
10. $x_1 = \frac{9\pi}{4}$ $x_2 = \frac{21\pi}{4}$	11. $x = \frac{\pi}{2}$	12. $x_1 = \frac{\pi}{8}$ $x_2 = \frac{3\pi}{8}$