## 7.4 - 7.5: (Trigonometric Equations)

The product of all solutions of the equation $\cos x - 2\sin^2 x + 1 = 0$ in the interval $[0,2\pi)$ is

A) $\frac{\pi^2}{3}$

B) $\frac{5\pi^3}{9}$

C) $\frac{11\pi^3}{36}$

D) $\frac{\pi^2}{6}$

E) $\frac{5\pi^3}{36}$

The sum of all the solutions of the equation $2\cos^2 x + |\cos x| - 1 = 0$, $0 < x \leq 2\pi$, is

A) $4\pi$

B) $3\pi$

C) $\frac{5\pi}{4}$

D) $\pi$

E) $5\pi$

The sum of all the solutions of the equation $\cot\theta + \tan\theta = 2,\ 0 \leq \theta < 2\pi$, is equal to

A) $\frac{3\pi}{2}$

B) $\frac{3\pi}{4}$

C) $2\pi$

D) $\frac{\pi}{2}$

E) $\pi$

If $\theta$ is the solution of $4\sin^2\theta + 2\cos^2\theta = 3, \frac{3\pi}{2} \leq \theta < 2\pi$, then $\sec\theta =$

A) $\sqrt{2}$

B) 2

C) $-\sqrt{2}$

D) $\frac{2\sqrt{3}}{3}$

E) $-\frac{2\sqrt{3}}{3}$

The number of solutions of $(\cos x)(\cos x + 1) = 2,\ 0 \leq x < 2\pi$ is equal to

A) 4

B) 1

C) 2

D) 3

E) 5

The sum of all the solutions of $\sin 2x \cos x + \cos 2x \sin x = 0, 0 \leq x < \pi$ is equal to

A) $5\pi$

B) $\pi$

C) $4\pi$

D) $2\pi$

E) $3\pi$

The sum of all solutions of the equation $\sin^{-1} x + \tan^{-1} x = 0$ is

A) zero

B) a negative irrational number

C) a positive irrational number

D) a negative integer

E) a positive

If $\cos^{-1} x = 2\sin^{-1} \frac{1}{2}$, then $x =$

A) $\frac{1}{2}$

B) $\frac{\sqrt{3}}{2}$

C) $-\frac{1}{2}$

D) $-\frac{\sqrt{3}}{2}$

E) 1

The sum of all the solutions of the equation $2\sin\theta(\sin\theta - 1) = 3(\sin\theta + 1),\ 0 \leq \theta < 360°$, is

A) $540°$

B) $420°$

C) $360°$

D) $240°$

E) $620°$

The sum of all the solutions of $\cos\theta - \sin\theta = \sqrt{2}\sin\frac{\theta}{2}, 0 \leq \theta < 2\pi$ is

A) $\frac{5\pi}{3}$

B) $\frac{13\pi}{6}$

C) $\frac{5\pi}{2}$

D) $\frac{17\pi}{6}$

E) $\frac{3\pi}{2}$

The sum of solutions of the equation $\cos 2x - \cos x = 0$, on the interval $[0, 2\pi)$ is

(a) $2\pi$

(b) $\pi$

(c) $4\pi$

(d) $3 =$

(e) $5\pi$

The sum of all solutions of the equation $\sin 2x + 2\sqrt{3}\cos x - \sin x = \sqrt{3}$ over the interval $[0,2\pi)$ is

A) $2\pi$

B) $5\pi$

C) $3\pi$

D) $4\pi$

E) $6\pi$

The sum of all solutions of the equation: $\tan\frac{x}{2} = \sin x, 0 \leq x < 2\pi$ is equals to

A) $2\pi$

B) $\frac{\pi}{2}$

C) $\frac{3\pi}{2}$

D) $\pi$

E) $3\pi$

If $\theta$ is the solution of the equation $2\tan\theta + \sec^2\theta = 4$, $\frac{3\pi}{2} < \theta < 2\pi$ then $\cos\theta =$

A) $\frac{\sqrt{10}}{10}$

B) $\frac{\sqrt{5}}{5}$

C) $\frac{\sqrt{3}}{3}$

D) $\frac{\sqrt{6}}{6}$

E) $\frac{\sqrt{2}}{2}$

The sum of all the solutions of $\sin\left(\theta+\frac{\pi}{4}\right)+\sin\left(\theta-\frac{\pi}{4}\right)=-1,\ 0\leq\theta<2\pi$, is equal to

A) $3\pi$

B) $5\pi$

C) $\pi$

D) $4\pi$

E) $1.5\pi$

If $0\leq x<2\pi$, then the number of all solutions of the equation $2\sin\left(2x+\frac{\pi}{6}\right)-1=0$ is

A) 4

B) 3

C) 5

D) 6

E) 8

The number of solution(s) of the equation $\tan x + \sqrt{3} = \sec x$ interval $[0, 360°)$ is

A) One

B) Two

C) Three

D) Four

E) Five

The sum of all the solutions of the equation $2 \sin x \cos x - 2\sin x + \cos x = 1$, in the interval $[0,2\pi)$ is

A) $3\pi$

B) $\frac{5\pi}{3}$

C) $2\pi$

D) $\frac{4\pi}{3}$

E) $\frac{7\pi}{3}$

The number of all solutions of the equation $\sin x - \cos x = 2, 0 \leq x < 2\pi$, is

A) 0

B) 2

C) 3

D) 4

E) 1

The sum of all the solutions of the equation $2\sin x \cos x + 3\cos x = 0$ in the interval $[0,2\pi)$, is equal to

A) $2\pi$

B) $\frac{5\pi}{2}$

C) $3\pi$

D) $\pi$

E) $\frac{3\pi}{2}$

The sum of all solutions of the equation $\sin 3x \cos x - \cos 3x \sin x - \frac{1}{2} = 0$, where $0 \leq x < 2\pi$, is

A) $\frac{4\pi}{3}$

B) 0

C) $\frac{5\pi}{12}$

D) $\pi$

E) $3\pi$

If $0 \leq x < 2\pi$, then the sum of all solution(s) of the equation $\sin^2 x - \sin x - 2 = 0$, is equal to

A) $\frac{3\pi}{2}$

B) $\pi$

C) $\frac{5\pi}{3}$

D) $2\pi$

E) $\frac{5\pi}{2}$

The number of solutions of the equation $4\sin^2 x + 2\sqrt{3}\sin x - \sqrt{3} = 2\sin x$ , $0 \leq x < 2\pi$ is

A) 4

B) 5

C) 3

D) 2

E) 1

The number of solutions of $\tan^2 \theta = \frac{3}{2}\sec\theta$ on the interval $[0,2\pi)$ is equal to

A) 2

B) 3

C) 1

D) 4

E) 5

The number of solutions of the equation $4\sin x\cos x = \sqrt{2},\ 0 \leq x < 2\pi$, is

(a) 4

(b) 1

(c) 2

(d) 3

(e) 5

If $0° \leq x < 360°$, then the number of solutions of the equation

$4\tan x \sin^2 x + \tan x - 4\sqrt{3}\sin^2 x - \sqrt{3} = 0$, is equal to

A) 2

B) 3

C) 4

D) 5

E) 6

The sum of the solution(s) of the equation $\sqrt{2}\sec\frac{x}{2}+2=0$, in the interval $[0,2\pi)$ is

A) $\frac{3\pi}{2}$

B) $\frac{3\pi}{4}$

C) $4\pi$

D) $2\pi$

E) $\pi$

The sum of the solutions of the equation $\csc^2 x-2\cot x=0$ in the inverval $[0,2\pi)$ is

A) $\frac{3\pi}{2}$

B) $\frac{5\pi}{2}$

C) $\frac{5\pi}{4}$

D) $\pi$

E) $\frac{9\pi}{4}$

The equation $\cos x \cos 3x + \sin x \sin 3x = \frac{1}{2}, -\pi \leq x < 0$, has

A) 2 solutions

B) 1 solution

C) 3 solutions

D) 4 solutions

E) 5 solutions

If $0° \leq x < 360°$, then the number of solutions of the equation $4 \sin x \cos x + 5\cos x = 0$, is equal to

A) 2

B) 1

C) 4

D) 0

E) 3

The sum of the solutions of the equation over the interval $[0,2\pi)$

$2\sin x\cos x + 2\sin x - \cos x - 1 = 0$ is:

A) $2\pi$

B) $\pi$

C) $\frac{3\pi}{2}$

D) $3\pi$

E) $\frac{7\pi}{6}$

The sum of solutions of the equation $2\tan x = \sec^2 x$ in the interval $[0,2\pi)$ is equal to

A) $\frac{3\pi}{2}$

B) $\frac{\pi}{4}$

C) $5\pi$

D) $\pi$

E) $\frac{3\pi}{4}$

The number of solutions of the equation: $\tan\frac{x}{2} = \sin x\ , 0 \leq x < 2\pi$ is:

A) 3

B) 2

C) 1

D) 4

E) 5

The sum of all the solutions of the equation $2\cos x = \sin^2 x - 2$ in $[0,2\pi)$, is equal to

A) $\pi$

B) $2\pi$

C) $3\pi$

D) $\frac{\pi}{2}$

E) $\frac{3\pi}{2}$

The number of solutions of the equation $\sqrt{3}\cot^2 x + \cot x - 1 - \sqrt{3}\cot x = 0$ over the interval $\left[0, \frac{3\pi}{2}\right]$ is:

A) 3

B) 1

C) 2

D) 4

E) 0

Let n be any integer, then all solutions of the equation $\frac{4\tan\theta}{1-\tan^2\theta} - 2 = 0$ are

A) $(1 + 4n)\frac{\pi}{8}$

B) $(1 + 3n)\frac{\pi}{4}$

C) $(1 + 4n)\frac{3\pi}{4}$

D) $(1 + 3n)\frac{\pi}{8}$

E) $(1 + 3n)\frac{\pi}{6}$

The sum of solutions of the equation $\cos x \cos 2x - \sin x \sin 2x = 0,\ 0 \leq x < \pi$, is

A) $\frac{7\pi}{6}$

B) $\frac{5\pi}{2}$

C) $\frac{3\pi}{2}$

D) $\frac{5\pi}{6}$

E) $3\pi$

The number of solutions of the equation $3 + \cos 2\theta = 5\cos\theta, 0 \leq \theta \leq 4\pi$ is equal to

A) 8

B) 10

C) 4

D) 6

E) 2

The sum of all solutions of the equation $2\sin^2 x - \cos x = 1$ in the interval $[0,3\pi)$ is

A) $2\pi$

B) $\frac{16\pi}{3}$

C) $\frac{11\pi}{12}$

D) $3\pi$

E) $\frac{11\pi}{6}$

The sum of all solutions of the equation $-2\cos 2x \sin 3x + 2\cos 3x \sin 2x = \sqrt{3}$ in the interval $[-\pi, \pi]$ is

A) $-\frac{4\pi}{3}$

B) $-\frac{2\pi}{3}$

C) $\frac{2\pi}{3}$

D) $-\pi$

E) $\frac{\pi}{3}$

The equation $\sin x + \cos x = 2,\ 0 \leq x < 2\pi$, has

A) no solution

B) 3 solutions

C) 1 solution

D) 4 solutions

E) 2 solutions

The number of solutions of the equation $2\cos^2 3\theta - 2\cos 3\theta - \sqrt{3}\cos 3\theta + \sqrt{3} = 0; 0 \leq x < 2\pi$ is:

A) 9

B) 4

C) 5

D) 6

E) 3

The sum of solutions of the equation $2\sin^2\frac{x}{2} = \cos x$, over the interval $[0,2\pi)$ is equal to

(a) $2\pi$

(b) in

(c) $3 =$

(d) $4\pi$

(e) $-\pi$

If $0° \leq x < 360°$, then the sum of all solutions of the equation $4\cos 2x = 8\sin x \cos x$ is equal to

A) $630°$

B) $135°$

C) $505°$

D) $545°$

E) $475°$

The solution set of $\sqrt{3}\sin x + \cos x - 1 = 0$ is equal to

A) $\left\{2\pi k, \frac{2\pi}{3} + 2k\pi, \text{where } k \text{ is an integer } \right\}$

B) $\left\{\frac{\pi}{4} + 2\pi k, \frac{5\pi}{4} + 2k\pi, \text{where } k \text{ is an integer } \right\}$

C) $\left\{2\pi k, \frac{2\pi}{3} + 2k\pi, \frac{4\pi}{3} + 2k\pi \text{ where } k \text{ is an integer } \right\}$

D) $\{2\pi k, \text{where } k \text{ is an integer } \}$

E) $\left\{2\pi k, \frac{5\pi}{3} + 2k\pi, \text{where } k \text{ is an integer } \right\}$

The solution set of the equation $\cot^2 x - \csc x - 1 = 0,\ 0 \leq x < 2\pi$ is:

A) $\left\{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}\right\}$

B) $\left\{\frac{\pi}{6}, \frac{7\pi}{6}, \frac{\pi}{2}\right\}$

C) $\left\{\frac{\pi}{3}, \frac{2\pi}{3}, \frac{3\pi}{2}\right\}$

D) $\left\{\frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}\right\}$

E) $\left\{\frac{\pi}{6}, \frac{7\pi}{6}, \pi\right\}$

The sum of all solutions of the equation $4\sin 2x + \sin 4x = 0,\ 0 \leq x < 2\pi$ is

A) $3\pi$

B) $\frac{7\pi}{3}$

C) $\frac{13\pi}{6}$

D) $\frac{5\pi}{2}$

E) $5\pi$

The sum of all the solutions of the equation $\tan x \cos x - \tan x - \cos x + 1 = 0$, in $[0,2\pi)$ is equal to

A) $\frac{3\pi}{2}$

B) $\frac{\pi}{4}$

C) $\frac{13\pi}{4}$

D) $\frac{13\pi}{12}$

E) $\frac{5\pi}{2}$

The number of solutions of the equation $4\cos\theta\sin\theta = \sqrt{3}$ over the interval $[0°, 360°)$ is

A) 4

B) 5

C) 3

D) 2

E) 1

The solution of the equation $\cos^{-1} x + \tan^{-1}\frac{5}{12} = \frac{\pi}{2}$ is

A) $\frac{5}{13}$

B) $-\frac{12}{13}$

C) $\frac{13}{12}$

D) $-\frac{13}{5}$

E) $\frac{7}{12}$

The sum of all solutions of the equation $\sin 3x \cos x - \cos 3x \sin x - \frac{1}{2} = 0$, where $0 \leq x < 2\pi$, is

A) $\frac{4\pi}{3}$

B) 0

C) $\frac{5\pi}{12}$

D) $\pi$

E) $3\pi$

The solution set of the equation $2\cos^{-1}\left(\frac{x-\pi}{3}\right) = 2\pi$ is

A) $\{\pi - 3\}$

B) $\{\pi + 2\}$

C) $\{4 - \pi\}$

D) $\{2\pi - 3\}$

E) $\{\pi\}$

The sum of all solutions of the equation $-2\cos 2x\sin 3x + 2\cos 3x\sin 2x = \sqrt{3}$ on $[-\pi, \pi]$ is

A) $-\pi$

B) $-\frac{\pi}{3}$

C) $-\frac{2\pi}{3}$

D) $\pi$

E) $\frac{2\pi}{3}$

The number of all solutions of the equation $\sin\theta = \sec\theta$ for $0 \leq \theta < 2\pi$ is

(a) 0
(b) 1
(c) 2
(d) 3
(e) 4

The sum of all solutions of the equation $4\cos^2\theta - 4\cos\theta = -1, \quad 0 \leq \theta < 2\pi$, is

(a) $2\pi$
(b) $\pi$
(c) $3\pi$
(d) $4\pi$
(e) 0