Solving more Trig Equations ws

1) $3x^2+5x=0$

$x(3x+5)=0$

$\boxed{x=0}$ $3x+5=0$

$3x=-5$

$\boxed{x=-\frac{5}{3}}$

2) $x^2-3x-28=0$

$(x-7)(x+4)=0$

$x-7=0$ $x+4=0$

$\boxed{x=7,-4}$

3) $2x^2+3x=5$

$2x^2+3x-5=0$

$(2x+5)(x-1)=0$

$2x+5=0$ $x-1=0$

$\boxed{x=-5/2}$ $\boxed{x=1}$

4) $8x^2=6x$

$8x^2-6x=0$

$2x(4x-3)=0$

$2x=0$ $4x-3=0$

$\boxed{x=0}$ $\boxed{x=3/4}$

5) $2x^2+7x+6=0$

$(2x+3)(x+2)=0$

$2x+3=0$ $x+2=0$

$\boxed{x=-3/2}$ $\boxed{x=-2}$

6) $3x^2=13x-4$

$3x^2-13x+4=0$

$(3x-1)(x-4)=0$

$3x-1=0$ $x-4=0$

$\boxed{x=1/3}$ $\boxed{x=4}$

7) $\frac{5}{10}=\frac{10\cos^2 x}{10}$

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

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

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

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

8) $4\sin x=\sqrt{3}+2\sin x$

$-2\sin x$ $-2\sin x$

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

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

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

9) $3\sin^2 x=\cos^2 x$

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

$4\sin^2 x=1$

$\sin^2 x=\frac{1}{4}$

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

$\boxed{x=\frac{\pi}{6},\frac{5\pi}{6},\frac{7\pi}{6},\frac{11\pi}{6}}$

10) $\sin x=\sin(-x)+1$

$\sin x=-\sin x+1$

$2\sin x=1$

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

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

11) $4\cos x \sin^2 x = \cos x$

$4\cos x \sin^2 x - \cos x = 0$

$\cos x(4\sin^2 x - 1) = 0$

$\cos x = 0 \quad 4\sin^2 x - 1 = 0$

$\sin^2 x = \frac{1}{4}$

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

$x = \frac{\pi}{2}, \frac{3\pi}{2}$ | $x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

12) $\cot^2 x = \sqrt{3}\cot x$

$\cot^2 x - \sqrt{3}\cot x = 0$

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

$\cot x = 0 \quad \cot x - \sqrt{3} = 0$

$\cot x = \sqrt{3}$

$x = \frac{\pi}{2}, \frac{3\pi}{2}$ | $x = \frac{\pi}{6}, \frac{7\pi}{6}$

13) $2\cos^2 x - \cos x = 1$

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

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

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

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

$x = \frac{2\pi}{3}, \frac{4\pi}{3}$ | $x = 0\pi$

14) $\sin^2 x = 2\cos x + 2$

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

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

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

$\cos x + 1 = 0$

$\cos x = -1$

$x = \pi$

15) $\sec^2 x = \tan x + 1$

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

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

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

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

$\tan x = 1$

$x = 0\pi, \pi$ | $x = \frac{\pi}{4}, \frac{5\pi}{4}$

16) $3\cos x + 3 = 2\sin^2 x$

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

$3\cos x + 3 = 2 - 2\cos^2 x$

$2\cos^2 x + 3\cos x + 1 = 0$

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

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

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

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

17) $\cot^2 x + \csc^2 x = 3$

$\csc^2 x - 1 + \csc^2 x = 3$

$2\csc^2 x = 4$

$\csc^2 x = 2$

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

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

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

18) $2\sin^2 x = 3 - 3\cos x$

$2(1-\cos^2 x) = 3 - 3\cos x$

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

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

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

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

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

$x = \frac{\pi}{3}, \frac{5\pi}{3}$ $\qquad$ $x = 0\pi$

19) $3\tan^2 x + 4\sec x = -4$

$3(\sec^2 x - 1) + 4\sec x + 4 = 0$

$3\sec^2 x - 3 + 4\sec x + 4 = 0$

$3\sec^2 x + 4\sec x + 1 = 0$

$(3\sec x + 1)(\sec x + 1) = 0$

$3\sec x + 1 = 0 \qquad \sec x + 1 = 0$

$\sec x = -\frac{1}{3} \qquad \sec x = -1$

$\cos x = -3 \qquad \cos x = -1$

n/a $\qquad$ $x = \pi$

20) $\sec^2 x = 2\tan x$

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

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

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

$\tan x - 1 = 0$

$\tan x = 1$

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

21) $3\cos x + \sqrt{2} = \cos x$

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

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

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

22) $2\cos x \csc x = \sqrt{3}\csc x$

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

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

$\csc x = 0 \qquad 2\cos x - \sqrt{3} = 0$

$\sin x = \text{und.} \qquad 2\cos x = \sqrt{3}$

n/a $\qquad \cos x = \frac{\sqrt{3}}{2}$

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