TRIGONOMETRIC EQUATIONS

SYNOPSIS

- Equations involving one or more than one trignometric ratios of unknown angles are called trignometric equations.

  Eq: $3Cos2\theta + 4Cos\theta = 0$ is trignometric equation in unknown angle 'θ'.

- **Solution of a trigonometric equation**: A value of the unknown angle satisfying the given equation is called the solution of the given equation. Every other coterminal angle of a solution is also solution of the given trignometric equation. A trigonometric equation has infinite solutions.

- **Principle Value**: If θ or x has infinitely many solutions among them the least value with sign is called principle value of θ or 'x'. It is denoted by 'α'.

  Ex: Principle value of $Sin\theta = \frac{1}{2}$ is $\frac{\pi}{6}\left(=\alpha\right)$

  Principle value of $Cos\theta = -\frac{1}{2}$ is $\frac{2\pi}{3}$

  Principle value of $Tan\theta = -1$ is $-\frac{\pi}{4}$

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TRIGONOMETRIC EQUATION	GENERAL SOLUTION
$Sin\theta = 0$	$\theta = n\pi,\ \forall\ n \in z$
$Cos\theta = 0$	$\theta = (2n+1)\frac{\pi}{2},\ \forall\ n \in z$
$Tan\theta = 0$	$\theta = n\pi, \forall n \in z$
$Sin\theta = k, -1 \le k \le 1$	$\theta = n\pi + (-1)^n\alpha, \forall n \in z$
$Cos\theta = k, -1 \le k \le 1$	$\theta = 2n\pi \pm \alpha, \forall n \in z$
$Tan\theta = k, k \in R$	$\theta = n\pi + \alpha, \forall n \in z$

- The general solution of $Sin^2\theta = Sin^2\alpha$ (or) $Cos^2\theta = Cos^2\alpha$ (or) $Tan^2\theta = Tan^2\alpha$ is $\theta = n\pi \pm \alpha$.

  Ex: If $Tan^2\theta = 3 \Rightarrow Tan^2\theta = (\sqrt{3})^2 = Tan^2\frac{\pi}{3}$

  G.S. is $\theta = n\pi \pm \frac{\pi}{3}$

- Common Solution of Two Equations.

  The common solution is

  $\theta = 2n\pi + \phi$, where $\phi \in \left[0, 2\pi\right]$

  $\phi = \pi + \frac{\pi}{6} = \frac{7\pi}{6}$

  Ex:The solution of

  $Sin\theta = -\frac{1}{2}$, $Tan\theta = \frac{1}{\sqrt{3}}$,is $\theta = 2n\pi + \frac{7\pi}{6}$

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Angle θ	Sin θ	Cos θ
15^0	$\frac{\sqrt{3}-1}{2\sqrt{2}}$	$\frac{\sqrt{3}+1}{2\sqrt{2}}$
18^0	$\frac{\sqrt{5}-1}{4}$	$\sqrt{\frac{10+2\sqrt{5}}{4}}$
$22\frac{1}{2}^0$	$\sqrt{\frac{\sqrt{2}-1}{2\sqrt{2}}}$	$\sqrt{\frac{\sqrt{2}+1}{2\sqrt{2}}}$
36^0	$\sqrt{\frac{10-2\sqrt{5}}{4}}$	$\frac{\sqrt{5}+1}{4}$
54^0	$\frac{\sqrt{5}+1}{4}$	$\sqrt{\frac{10-2\sqrt{5}}{4}}$
$67\frac{1}{2}^0$	$\sqrt{\frac{\sqrt{2}+1}{2\sqrt{2}}}$	$\sqrt{\frac{\sqrt{2}-1}{2\sqrt{2}}}$
72^0	$\sqrt{\frac{10+2\sqrt{5}}{4}}$	$\frac{\sqrt{5}-1}{4}$
75^0	$\frac{\sqrt{3}+1}{2\sqrt{2}}$	$\frac{\sqrt{3}-1}{2\sqrt{2}}$

Tan 15^0 = $2-\sqrt{3}$ Tan $22\frac{1}{2}^0$ = $\sqrt{2}-1$

Cot 15^0 = $2+\sqrt{3}$ Cot $22\frac{1}{2}^0$ = $\sqrt{2}+1$

- The equation has $a\cos\theta + b\sin\theta = c$ has a solution if $|c| \le \sqrt{a^2+b^2}$.

  The equation $a\cos\theta + b\sin\theta = c$ has no solution if $|c| > \sqrt{a^2+b^2}$

LEVEL-I

1. The principle value of $Tan\theta = -\frac{1}{\sqrt{3}}$

   1) $-\frac{\pi}{4}$ 2) $-\frac{\pi}{3}$ 3) $-\frac{\pi}{6}$ 4) $\frac{\pi}{6}$

2. If $2Cos^2\theta = 1$ then $\theta = ------$

   1) 30^0, 150^0 2) 45^0,135^0
   3) 60^0, 120^0 4) 90^0, 180^0

3. If $4Cos^2\theta = 3$ then $\theta = ----$

   1) $\frac{\pi}{6},\frac{5\pi}{6}$ 2) $\frac{\pi}{4},\frac{3\pi}{4}$ 3) $\frac{\pi}{3},\frac{2\pi}{3}$ 4) $\pm\frac{\pi}{2}$

4. If $Cos2\theta = Cos^2\theta$ then $\theta = -----$

1) $0, \frac{\pi}{2}$ 2) $\frac{\pi}{2}, \frac{3\pi}{2}$ 3) $\frac{\pi}{6}, \frac{5\pi}{6}$ 4) $0, \pi$

5. If $Cos2\theta = 2Sin^2\theta$ then $\theta = -----$

1) $\pm 30^0$ 2) $\pm 60^0$ 3) $\pm 45^0$ 4) $\pm 90^0$

6. If $3Tan\theta = Cot\theta$ then $\theta = -----$

1) $\pm 30^0$ 2) $\pm 60^0$ 3) $\pm 45^0$ 4) $\pm 15^0$

7. If $3Tan(\theta - 15^0) = Tan(\theta + 15^0), 0 < \theta < \pi$ then $\theta = -----$

1) $\frac{\pi}{2}$ 2) $\frac{\pi}{4}$ 3) $\frac{\pi}{6}$ 4) $\frac{\pi}{3}$

8. The principle solution of $Cos\theta = -\frac{\sqrt{3}}{2}$ is

1) $\frac{\pi}{6}$ 2) $\frac{3\pi}{2}$ 3) $\frac{5\pi}{6}$ 4) $\frac{7\pi}{6}$

9. If $Tan\theta + Sec\theta = \sqrt{3}$, then the principle value of $\left(\theta + \frac{\pi}{6}\right)$ is

1) $\frac{\pi}{3}$ 2) $\frac{\pi}{4}$ 3) $\frac{2\pi}{3}$ 4) $\frac{\pi}{2}$

10. The principle value of $\left(\theta + \frac{\pi}{4}\right)$ where $Sin\theta + Cos\theta = 1$ is

1) 0^0 2) $\frac{\pi}{3}$ 3) $\frac{\pi}{4}$ 4) $\frac{\pi}{2}$

11. If $\gamma\ Sin\theta = 3, \gamma = 4(1 + Sin\theta), 0 \le \theta \le 2\pi$ then $\theta = ----$

1) $\frac{\pi}{6}, \frac{5\pi}{6}$ 2) $\frac{\pi}{3}, \frac{2\pi}{3}$ 3) $\frac{\pi}{4}, \frac{5\pi}{4}$ 4) $\frac{\pi}{2}, \pi$

12. If $Cot\theta - Tan\theta = 2$ then principle value of 'θ'

1) $\frac{\pi}{4}$ 2) $\frac{\pi}{2}$ 3) $\frac{\pi}{8}$ 4) $\frac{3\pi}{4}$

13. If $Tan^2\theta = \sqrt{3} + (\sqrt{3} - 1)Tan\theta$ and θ lies in $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ then $\theta =$

1) $\left\{\frac{-\pi}{3}, \frac{\pi}{4}\right\}$ 2) $\left\{\frac{\pi}{3}, \frac{-\pi}{4}\right\}$

3) $\left\{\frac{\pi}{6}, \frac{-\pi}{3}\right\}$ 4) $\left\{\frac{-\pi}{12}, \frac{\pi}{12}\right\}$

14. $Cos\theta + \sqrt{3}Sin\theta = 2$ then $\theta = ----$

1) $\frac{\pi}{3}$ 2) $\frac{2\pi}{3}$ 3) $\frac{4\pi}{3}$ 4) $\frac{5\pi}{3}$

15. If $Sin\theta + Sin3\theta + Sin5\theta = 0, 0 \le \theta \le \frac{\pi}{2}$ then $\theta = ----$

1) $0, \frac{\pi}{3}$ 2) $0, \frac{\pi}{2}$ 3) $1, \frac{\pi}{2}$ 4) $2, \frac{\pi}{3}$

16. If $Sin\theta + Sin5\theta = Sin3\theta, 0 \le \theta \le \pi$ then $\theta = ----$

1) $0, \frac{\pi}{6}, \frac{\pi}{3}, \frac{2\pi}{3}, \frac{5\pi}{6}, \frac{3\pi}{2}$ 2) $0, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{5\pi}{6}, \pi$

3) $0, \frac{\pi}{6}, \frac{\pi}{3}, \frac{2\pi}{3}, \frac{5\pi}{6}, \pi$ 4) $0, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{\pi}{3}, 2\pi$

17. If $Cos6\theta + Cos4\theta + Cos2\theta + 1 = 0$ $for\ 0 \le \theta \le \pi$, then θ =

1) $\frac{\pi}{7}, \frac{5\pi}{7}, \pi$ 2) $\frac{\pi}{2}, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{6}, \frac{5\pi}{6}$

3) $\frac{\pi}{8}, \frac{3\pi}{8}, \frac{5\pi}{8}, \frac{7\pi}{8}, \frac{\pi}{3}, \frac{2\pi}{3}$ 4) $\frac{\pi}{9}, \frac{4\pi}{9}, \frac{5\pi}{9}$

18. If $Cos2\theta.Cos3\theta.Cos\theta = \frac{1}{4}$ for $0 < \theta < \pi, then\ \theta =$

1) $\frac{\pi}{7}, \frac{5\pi}{7}, \pi$ 2) $\frac{\pi}{2}, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{6}, \frac{5\pi}{6}$

3) $\frac{\pi}{8}, \frac{3\pi}{8}, \frac{5\pi}{8}, \frac{7\pi}{8}, \frac{\pi}{3}, \frac{2\pi}{3}$ 4) $\frac{\pi}{9}, \frac{4\pi}{9}, \frac{5\pi}{9}$

19. If $3Tan^4\alpha - 10Tan^2\alpha + 3 = 0$ then principal values of 'α' are

1) $\pm 45^0, \pm 36^0$ 2) $\pm 30^0, \pm 60^0$

3) $\pm 75^0, \pm 36^0$ 4) $\pm 60^0, \pm 15^0$

20. The solution of $Sinx + Cosx = 2$ is

1) 0 2) $\pi/2$ 3) $\pi/4$ 4) No solution

21. If $Sin\left(\frac{\pi Cot\theta}{4}\right) = Cos\left(\frac{\pi Tan\theta}{4}\right)$ and θ is in the first quardant then θ =-----

1) $\frac{\pi}{3}$ 2) $\frac{\pi}{2}$ 3) $\frac{\pi}{4}$ 4) $\frac{\pi}{6}$

22. If $81^{Sin^2x} + 81^{Cos^2x} = 30\ and\ 0 \le x \le \frac{\pi}{2}$ then x=

1) $\frac{\pi}{6}, \frac{\pi}{3}$ 2) $\frac{\pi}{4}, \frac{\pi}{2}$ 3) $\frac{3\pi}{4}, \frac{2\pi}{3}$ 4) $\frac{\pi}{2}, \frac{4\pi}{3}$

23. If $(1 + Tan\theta)(1 + Tan\phi) = 2, then \theta + \varphi$ =

1) 30^0 2) 45^0 3) 60^0 4) 75^0

24. If A and B are acute angles such that $SinA=Sin^2B$ and $2Cos^2A=3Cos^2B$ then A=

1) $\frac{\pi}{4}$ 2) $\frac{\pi}{6}$ 3) $\frac{\pi}{3}$ 4) $\frac{\pi}{2}$

25. The values of x lying between 0^0 and 360^0 which satisfy the equation Cosec x-2Sin x-1=0 are

1) $30^0, 240^0$ 2) $120^0, 240^0$
3) $30^0, 150^0, 270^0$ 4) $90^0, 135^0$

26. If $2Sin^2x+Sin^22x=2$, $0<x<\pi$, then the values of x are

1) $\frac{\pi}{4},\frac{\pi}{2},\frac{3\pi}{4}$ 2) $\frac{\pi}{3},\frac{2\pi}{3},\frac{\pi}{5}$

3) $\frac{\pi}{6},\frac{2\pi}{3},\frac{\pi}{4}$ 4) $\frac{\pi}{6},\frac{\pi}{2},\frac{2\pi}{3}$

27. If $Sin\theta+Cos\theta=\sqrt{2}$, then the principle value of $\left(\theta+\frac{\pi}{4}\right)$ is

1) $\frac{\pi}{3}$ 2) $\frac{\pi}{6}$ 3) $\frac{\pi}{4}$ 4) $\frac{\pi}{2}$

28. If $Sin\left(x+28^0\right)=Cos\left(3x-78^0\right)$ then x =

1) 37^0 2) 39^0 3) 35^0 4) 47^0

29. If a is any real number, the number of roots of Cotx - Tanx = a in the first quadrant is

1) 2 2) 0 3) 1 4) 3

30. The most general value of θ satisfying the equations $Sin\theta=\frac{1}{\sqrt{2}}$, $Cos\theta=-\frac{1}{\sqrt{2}}$ is

1) $2n\pi+\frac{\pi}{4}$ 2) $2n\pi+\frac{3\pi}{4}$

3) $n\pi+\frac{\pi}{6}$ 4) $n\pi+\frac{\pi}{3}$

31. The most general value of θ satisfying the equations $Sec\theta=\frac{2}{\sqrt{3}}$ and $Cot\theta=1$ is

1) $2n\pi+\frac{\pi}{6}$ 2) $2n\pi+\frac{\pi}{4}$

3) ϕ 4) $2n\pi+\frac{\pi}{3}$

32. The general solution of $\frac{Tan3x-Tan2x}{1+Tan3x.Tan2x}=1$ is

1) $n\pi+\frac{\pi}{4}$ 2) $n\pi\pm\frac{\pi}{4}$ 3) ϕ 4) $n\pi+\frac{\pi}{6}$

33. The general solution of Sin2x=4Cosx is

1) $(2n+1)\frac{\pi}{2}$ 2) $n\pi$

3) No Solution 4) $2n\pi$

34. The general solution of $\frac{2Sinx}{Cosx}=\frac{4}{Cosx}$ is

1) $(2n+1)\frac{\pi}{2}$ 2) $n\pi$

3) No Solution 4) $2n\pi$

35. $Tan\left(\frac{\pi}{4}+\frac{A}{2}\right)+Tan\left(\frac{\pi}{4}-\frac{A}{2}\right)=\frac{4}{\sqrt{3}}$; then the general solution of A =

1) $2n\pi\pm\frac{\pi}{6}$ 2) $n\pi+\frac{\pi}{4}$

3) $2n\pi\pm\frac{\pi}{4}$ 4) $n\pi$

36. The general solution of $Cos^2\theta=\frac{1}{2}$ is

1) $2n\pi\pm\frac{\pi}{3}$ 2) $n\pi\pm\frac{\pi}{4}$

3) $n\pi+\frac{\pi}{6}$ 4) $2n\pi\pm\frac{\pi}{6}$

37. The general solution of $\frac{Tan5x-Tan4x}{1+Tan5x.Tan4x}=1$ is

1) $n\pi+\frac{\pi}{4}$ 2) $n\pi-\frac{\pi}{4}$ 3) ϕ 4) $n\pi\pm\frac{\pi}{4}$

38. The general solution of Sinx = 1/2

1) $n\pi+(-1)^n\frac{\pi}{3}$ 2) $n\pi+(-1)^n\frac{\pi}{4}$

3) $n\pi+(-1)^n\frac{\pi}{6}$ 4) $n\pi\pm\frac{\pi}{4}$

39. $\tan\left(\frac{\pi}{4}+\frac{x}{2}\right)-\tan\left(\frac{\pi}{4}-\frac{x}{2}\right)=2$ then the general solution of x =

1) $n\pi\pm\frac{\pi}{4}$ 2) $n\pi+\frac{\pi}{4}$ 3) $n\pi-\frac{\pi}{4}$ 4) $n\pi$

40. If Cosx = 0 then the general solution of x =

1) $n\pi$ 2) $\frac{n\pi}{2}$

3) $\frac{n\pi}{2}$;n is odd 4) No Solution

41. If SinA = SinB, CosA = CosB then A =

1) $n\pi+B$ 2) $2n\pi+B$
3) $2n\pi-B$ 4) $2n\pi\pm B$

42. If $11Sin^2x+7Cos^2x=8$ then x=-----

1) $n\pi\pm\frac{\pi}{6}$ 2) $n\pi\pm\frac{\pi}{4}$

3) $n\pi\pm\frac{\pi}{3}$ 4) $n\pi\pm\frac{\pi}{2}$

43. Solution of $Cot^2\theta+\left(\sqrt{3}+\frac{1}{\sqrt{3}}\right)Cot\theta+1=0$

1) $n\pi-\frac{\pi}{6}, n\pi-\frac{\pi}{3}$ 2) $n\pi+\frac{\pi}{6}, n\pi+\frac{\pi}{3}$

3) $n\pi+\frac{\pi}{12}$ 4) $n\pi+\frac{\pi}{4}$

44. $Cos^3\alpha+Cos^3(120^0+\alpha)+Cos^3(120^0-\alpha)=\frac{3\sqrt{3}}{4}$ then the general solution of α is

1) ϕ 2) $2n\pi\pm\frac{\pi}{3}$

3) $(2n+1)\frac{\pi}{2}$ 4) $n\pi$

45. 3Sinx+4Cosx-6=0 then the general solution of x=

1) $n\pi+(-1)^n\frac{\pi}{6}$ 2) $n\pi+(-1)^n\frac{\pi}{4}$

3) $n\pi+(-1)^n\frac{\pi}{3}$ 4) No Solution

46. If Tanx+2Tan2x+4Tan4x+8Cot8x= $\sqrt{3}$ then the general solution of x =

1) $n\pi+\frac{\pi}{3}$ 2) $n\pi+\frac{\pi}{6}$

3) $n\pi+\frac{\pi}{4}$ 4) $n\pi$

47. If Tanx+Tan2x+Tan8x=Tanx.Tan2x.Tan8x then the general solution of x =

1) $n\pi$ 2) $n\pi+\frac{\pi}{4}$ 3) $\frac{n\pi}{11}$ 4) $n\pi\pm\frac{\pi}{3}$

48. If TanA+Tan2A+ $\sqrt{3}$ TanATan2A= $\sqrt{3}$ then the general solution of $\frac{A}{2}$ =

1) $\frac{n\pi}{3}+\frac{\pi}{9}$ 2) $n\pi+\frac{\pi}{9}$

3) $\frac{n\pi}{6}+\frac{\pi}{18}$ 4) $\frac{n\pi}{3}+\frac{\pi}{4}$

49. The solution set of $(2Cosx-1)(3+2Cosx)=0$ in the interval $0\le x\le 2\pi$ is

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

3) $\left\{\frac{\pi}{3},\frac{5\pi}{3},Cos^{-1}\left(\frac{-3}{2}\right)\right\}$ 4) $\frac{\pi}{4}$

50. The number of solutions of the equation Sin5xCos3x=Sin6xCos2x in the interval $[0,\pi]$ is

1) 2 2) 3 3) 4 4) 5

51. General solution of $Tan\theta Tan2\theta=1$ is

1) $(2n+1)\frac{\pi}{6}$ 2) $\frac{n\pi}{3}\pm\frac{\pi}{6}$

3) $n\pi\pm\frac{\pi}{6}$ 4) $\frac{n\pi}{2}\pm\frac{\pi}{3}$

52. The number of solutions of the equation $Sin3\alpha=4Sin\alpha.Sin(x+\alpha).Sin(x-\alpha)$ where $0<\alpha<\pi$ for x in the interval $[0,\pi]$ is

1) 1 2) 2 3) 4 4) 5

53. If $Tan\theta+Cot\theta=4$, then θ is

1) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{12}$ 2) $n\pi+\frac{\pi}{12}$

3) $n\pi-\frac{\pi}{12}$ 4) $n\pi+(-1)^n\frac{\pi}{12}$

54. The solution of the equation

$Tan\left(\frac{\pi}{4}+\theta\right)+Cot\left(\frac{\pi}{4}+\theta\right)=4$ is given by θ =

1) $n\pi\pm\frac{\pi}{6}$ 2) $n\pi-\frac{\pi}{6}$ 3) $2n\pi\pm\frac{\pi}{6}$ 4) $n\pi+\frac{\pi}{6}$

55. Solution of Tanx + Tan(120+x) + Tan (120-x) = 0 is

1) $\frac{n\pi}{3}$ 2) $\frac{n\pi}{6}$ 3) $\frac{n\pi}{4}$ 4) $\frac{n\pi}{2}$

56. The general value of θ satisfying the equation

$Tan\theta Tan(120^0+\theta)Tan(120^0-\theta)=\frac{1}{\sqrt{3}}$ is

1) $(6n+1)\frac{\pi}{18}$ 2) $(3n+1)\frac{\pi}{3}$

3) $(6n+1)\frac{\pi}{6}$ 4) $(3n+1)\frac{\pi}{6}$

57. If $Tanm\theta=Cotn\theta$ then the G.S is θ =

1) $\frac{(k+1)\pi}{2(m+n)}$ 2) $\frac{(2k+1)\pi}{2(m+n)}$

3) $\frac{(2k+1)\pi}{m+n}$ 4) $\frac{(2k+1)\pi}{m-n}$

58. If x+y= $\frac{2\pi}{3}$,then the equation Cosx+Cosy=3/2 has

1) Unique solution 2) two solutions

3) no solution 4) infinite solution

59. The general solution of the equation $Sin^2\theta Sec\theta+\sqrt{3}Tan\theta=0$ is

1) $\theta=n\pi+(-1)^n\frac{\pi}{3}$ 2) $\theta=n\pi$

3) $\theta=n\pi+(-1)^n\frac{\pi}{4}$ 4) $\theta=\frac{n\pi}{6}$

60. If $Tanp\theta = Cotq\theta$ then solutions of θ are in ----- progression

1) A.P 2) G.P 3) H.P 4) A.G.P

61. If $Tan^2 2\theta = Cot^2\alpha$ then the general solution is

1) $\theta = \left(\frac{1}{4}\right)\left\{n\pi \pm \left(\frac{\pi}{2} - \alpha\right)\right\}$

2) $\theta = \left(\frac{1}{2}\right)\left\{n\pi \pm \left(\frac{\pi}{4} - \alpha\right)\right\}$

3) $\theta = \left(\frac{1}{2}\right)\left\{n\pi \pm \left(\frac{\pi}{2} - \alpha\right)\right\}$

4) $\theta = \left(\frac{1}{4}\right)\left\{n\pi \pm \left(\frac{\pi}{2} + \alpha\right)\right\}$

62. If Cosx+Cosy=1 and CosxCosy=1/4 then the G.S are

1) $x = 2n\pi \pm \frac{\pi}{4}, n \in Z,\ y = 2m\pi \pm \frac{\pi}{4}, m \in Z$

2) $x = 2n\pi \pm \frac{\pi}{3}, n \in Z,\ y = 2m\pi \pm \frac{\pi}{3}, m \in Z$

3) $x = 2n\pi \pm \frac{\pi}{6}, n \in Z,\ y = 2m\pi \pm \frac{\pi}{6}, m \in Z$

4) $x = 2n\pi \pm \frac{\pi}{5}, n \in Z,\ y = 2m\pi \pm \frac{\pi}{5}, m \in Z$

63. If $y + Cos\theta = Sin\theta$ has a real solution then

1) $-\sqrt{2} \le y \le \sqrt{2}$ 2) $y > \sqrt{2}$

3) $y \le -\sqrt{2}$ 4) $y \le 1$

64. If $Cos20^0 = k$ and Cosx=$2k^2$-1, then the possible values of x between 0^0 and 360^0 are

1) 140^0 2) 40^0 and 140^0

3) 40^0 and 320^0 4) 50^0 and 130^0

65. The equation $Sin^6x+Cos^6x = \lambda$ has a solution if

1) $\lambda \in \left[\frac{1}{2}, 1\right]$ 2) $\lambda \in \left[\frac{1}{4}, 1\right]$

3) $\lambda \in [-1, 1]$ 4) $\lambda \in (-2, 2)$

66. If $Tan(\pi Cos\theta) = Cot(\pi Sin\theta)$ then the value(s) of $Cos\left(\theta - \frac{\pi}{4}\right)$ is (are)

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

3) $\pm\frac{1}{2\sqrt{2}}$ 4) $\frac{1}{3\sqrt{2}}$

67. The values of x is $(-\pi, \pi)$ satisfying the equation $\frac{1+Tanx}{1-Tanx} = 1 + Sin2x$ are

1) $-\frac{\pi}{6}, \frac{5\pi}{6}$ 2) $-\frac{\pi}{4}, \frac{3\pi}{4}$

3) $\frac{\pi}{3}, \frac{-2\pi}{3}$ 4) $\frac{\pi}{3}, \frac{2\pi}{3}$

68. The set of values of a for which the equation $Sin^4x + Cos^4x = a$ has a solution is

1) $\left[\frac{-1}{2}, \frac{1}{2}\right]$ 2) $\left[\frac{1}{4}, 1\right]$ 3) $\left[\frac{1}{2}, 1\right]$ 4) $\left[\frac{1}{4}, \frac{1}{2}\right]$

69. If $0 \le x \le 2\pi$ then the set of values of x satisfying $2Sin^2x+3Sinx = 2$ is

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

3) $\left\{\frac{7\pi}{6}, \frac{11\pi}{6}\right\}$ 4) $\left\{\frac{4\pi}{3}, \frac{5\pi}{3}\right\}$

70. The most general values of θ satisfying the equation $(1+2\sin\theta)^2 + \left(\sqrt{3}\tan\theta - 1\right)^2 = 0$ are given by

1) $n\pi + \frac{\pi}{6}$ 2) $n\pi + (-1)^n \frac{7\pi}{6}$

3) $2n\pi + \frac{7\pi}{6}$ 4) $2n\pi + \frac{11\pi}{4}$

71. The number of distinct solutions of $\sec\theta + \tan\theta = \sqrt{3},\ 0 \le \theta \le 3\pi$, is

1) 2 2) 5 3) 4 4) 3

72. The number of values of x satisfying the equation $2\sin^2 x + 4\cos^2 x = 3$ in the interval $(0, 2\pi)$ is

1) 1 2) 2 3) 3 4) 4

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1. 3	2. 2	3. 1	4. 4	5. 1
6. 1	7. 2	8. 3	9. 1	10. 3
11. 1	12. 3	13. 2	14. 1	15. 1
16. 3	17. 2	18. 3	19. 2	20. 4
21. 3	22. 1	23. 2	24. 2	25. 3
26. 1	27. 4	28. 3	29. 3	30. 2
31. 3	32. 3	33. 1	34. 3	35. 1
36. 2	37. 1	38. 3	39. 2	40. 3
41. 2	42. 1	43. 1	44. 1	45. 4
46. 2	47. 3	48. 3	49. 2	50. 4
51. 3	52. 2	53. 2	54. 1	55. 1
56. 1	57. 2	58. 3	59. 2	60. 1
61. 3	62. 2	63. 1	64. 3	65. 2
66. 3	67. 2	68. 3	69. 2	70. 3
71. 1	72. 4			