Find the exact real number.

1. $\sin^{-1}\left(-\dfrac{\sqrt{2}}{2}\right) =$

2. $\tan^{-1}\left(-\sqrt{3}\right) =$

3. $\cot^{-1} 0 =$

4. $\sec^{-1} 2 =$

5. $\cot\left(\sec^{-1}\dfrac{5}{4}\right) =$

6. $\sin\left(\cos^{-1}\dfrac{1}{4}\right) =$

7. $\sec\left[\sin^{-1}\left(-\dfrac{\sqrt{3}}{2}\right)\right] =$

8. $\sin^{-1}\left(-\dfrac{\sqrt{3}}{2}\right)$

9. $\tan^{-1}\left(-1\right)$

10. $\sec^{-1}\left(-\sqrt{2}\right)$

Find the exact degree measure of θ.

11. $\theta = \sec^{-1}\left(-1\right)$

12 $\theta = \sec^{-1}\left(-\sqrt{2}\right)$

13. $\theta = \sec^{-1}\left(\sec -120°\right)$

14. $\theta = \cos^{-1}(\cos(30°))$

Find the exact real number.

15. $\tan\left[\tan^{-1} 4 - \sec^{-1}\left(-\sqrt{3}\right)\right] =$

16. $\cos\left(\dfrac{\cos^{-1}\dfrac{1}{4}}{2}\right) =$

17. $\tan\left[2\sec^{-1}\left(-\sqrt{7}\right)\right] =$

18. $\sin\left[\cos^{-1}\dfrac{4}{5} - \tan^{-1}-\dfrac{7}{24}\right] =$

19. $\cos\left(arc\cos\dfrac{\sqrt{3}}{2} - ar\ctan\left(-1\right)\right)$

20. $arc\cos\left(\sin\dfrac{2\pi}{3}\right).$

21. $\sin\left[arc\cos\left(-\dfrac{\sqrt{3}}{2}\right)+\tan^{-1}(1)\right]$

22. $\tan\left(arc\sin\dfrac{4}{5}+arc\cos\dfrac{4}{5}\right)$

23. $\sin\dfrac{1}{2}\left(arc\tan\left(-\dfrac{4}{3}\right)\right)$

24. $\cos\left[\dfrac{2\pi}{3}-\sin^{-1}(-1)\right]$

25. $\tan\left[arc\cos\dfrac{7}{25}+arc\sin\left(-\dfrac{4}{5}\right)\right]$

26. State the domain and range of $y = Arc\sin x$.

27. State the domain and range of $y = Arc\cos x$.

28. State the domain and range of $y = \tan^{-1}x$.

29. State the domain and range of $y = \csc^{-1}x$.

30. State the domain and range of $y = arc\cot x$.

Find all of the solutions to the following:

31. $15\sin x+19=14\sin x+18$

32. $5\cot x+12=6\cot x+13$

33. $2\cos^2 x=1$

34. $\csc^2 x=2$

35. $2\cos^2 x+3\cos x+1=0$

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

37. $\cos x=\sec x$

38. $4\sin^2 x-8\cos x+1=0$

39. $\cos 2x+3\cos x=-2$

40. $2\sin x-\sin 2x=0$

Find the exact solutions to each equation for the interval [0, 2pi].

41. $\sin^2 x+3\cos x=3$

42. $2\cos^3 x+\cos^2 x-\cos x=0$

43. $\cos^2 2x=\dfrac{1}{2}\cos 2x$

44. $\dfrac{\sin x}{\sin x-1}=\dfrac{\sin^2 x}{\sin x+3}$

45. $\sin 2x\cos x+\cos 2x\sin x=\dfrac{1}{2}$

46. $\cos 2x\cos x-\sin 2x\sin x=\dfrac{-\sqrt{3}}{2}$