

Find the exact real number.

1. $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = -\pi/4$

3. $\cot^{-1} 0 = \pi/2$

5. $\cot\left(\sec^{-1}\frac{5}{4}\right) = 4/3$

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

9. $\tan^{-1}(-1) = -\pi/4$

Find the exact degree measure of θ .

11. $\theta = \sec^{-1}(-1)$
 π

13. $\theta = \sec^{-1}(\sec - 100^\circ)$
 120°

Find the exact real number.

15. $\tan\left[\tan^{-1} 4 - \sec^{-1}(-\sqrt{3})\right] =$
 $\frac{12 + 17\sqrt{3}}{31}$

17. $\tan\left[2\sec^{-1}(-\sqrt{7})\right] =$
 $\frac{2\sqrt{6}}{5}$

19. $\cos\left(\arccos\frac{\sqrt{3}}{2} - \arctan(-1)\right)$
 $\frac{\sqrt{6} - \sqrt{2}}{4}$

2. $\tan^{-1}(-\sqrt{3}) = -\pi/3$

4. $\sec^{-1} 2 = \pi/3$

6. $\sin\left(\cos^{-1}\frac{1}{4}\right) = \sqrt{15}/4$

8. $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right) = -\pi/3$

10. $\sec^{-1}(-\sqrt{2}) = \frac{3\pi}{4}$

12. $\theta = \sec^{-1}(-\sqrt{2}) = \frac{3\pi}{4}$

14. $\theta = \cos^{-1}(\cos(30^\circ)) = 30^\circ$

16. $\cos\left(\frac{\cos^{-1}\frac{1}{4}}{2}\right) = \frac{\sqrt{10}}{4}$

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

20. $\arccos\left(\sin\frac{2\pi}{3}\right) = \pi/6$

$$21. \sin \left(\arccos \left(-\frac{\sqrt{3}}{2} \right) + \tan^{-1}(1) \right)$$



$$-\sqrt{6} + \sqrt{2}$$

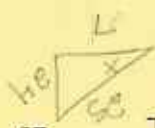
$$23. \sin \frac{1}{2} \left(\arccos \tan \left(-\frac{4}{3} \right) \right)$$



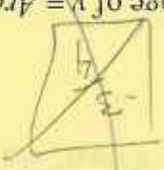
$$\sqrt{\frac{1 - \frac{4}{3}}{2}}$$

$$\sqrt{\frac{1 - \frac{4}{3}}{2}}$$

$$25. \tan \left[\arccos \frac{7}{25} + \arcsin \left(-\frac{4}{5} \right) \right]$$



$$\frac{1 - \frac{4}{5} \cdot \frac{7}{25}}{\frac{24}{25} + \frac{3}{25}}$$



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

$$D: [-1, 1]$$

$$R: \left[-\frac{\pi}{2}, \frac{\pi}{2} \right]$$

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

$$D: [-1, 1]$$

$$R: [0, \pi]$$

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

$$D: \mathbb{R}$$

$$R: \left(-\frac{\pi}{2}, \frac{\pi}{2} \right)$$

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

$$D: (-\infty, -1] \cup [1, \infty)$$

$$R: \left[-\frac{\pi}{2}, \frac{\pi}{2} \right], y \neq 0$$

30. State the domain and range of $y = \operatorname{arccot} x$.

$$D: \mathbb{R}$$

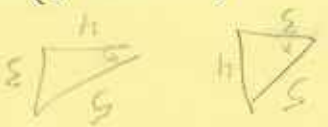
$$R: [0, \pi]$$

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

$$\frac{7\pi}{6} - \frac{\pi}{2}$$

$$-\sqrt{3}/2$$

$$22. \tan \left(\arcsin \frac{4}{5} + \arccos \frac{5}{4} \right)$$



$$\frac{1 - \frac{4}{5} \cdot \frac{3}{4}}{\frac{4}{5} + \frac{3}{4}}$$

und.

$$R: [0, \pi], y \neq \frac{\pi}{2}$$

$$\text{Note: } D: (-\infty, -1] \cup [1, \infty)$$

sec x

Find all of the solutions to the following:

1. $15\sin x + 19 = 14\sin x + 18$

$$x = \frac{3\pi}{2} + 2\pi k, k \in \mathbb{Z}$$

2. $5\cot x + 12 = 6\cot x + 13$

$$x = \frac{3\pi}{4} + \pi k, k \in \mathbb{Z}$$

3. $2\cos^2 x = 1$

$$x = \begin{cases} \pi/4 + \pi k \\ 3\pi/4 + \pi k \end{cases}, k \in \mathbb{Z}$$

5. $2\cos^2 x + 3\cos x + 1 = 0$

$$x = \begin{cases} \frac{2\pi}{3} + 2\pi k \\ \pi + 2\pi k \\ 4\pi/3 + 2\pi k \end{cases}, k \in \mathbb{Z}$$

7. $\cos x = \sec x$

$$x = \pi k, k \in \mathbb{Z}$$

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

$$x = \begin{cases} \frac{2\pi}{3} + 2\pi k \\ \pi + 2\pi k \\ 4\pi/3 + 2\pi k \end{cases}, k \in \mathbb{Z}$$

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

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

$$x = \{0, 2\pi\}$$

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

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

15. $\sin 2x \cos x + \cos 2x \sin x = \frac{1}{2}$

$$x = \left\{ \frac{\pi}{18}, \frac{5\pi}{18}, \frac{13\pi}{18}, \frac{17\pi}{18}, \frac{25\pi}{18}, \frac{29\pi}{18} \right\}; x = \left\{ \frac{7\pi}{18}, \frac{11\pi}{18}, \frac{19\pi}{18}, \frac{23\pi}{18}, \frac{31\pi}{18}, \frac{35\pi}{18} \right\}$$

4. $\csc^2 x = 2$

$$x = \begin{cases} \frac{\pi}{4} + \pi k \\ \frac{3\pi}{4} + \pi k \end{cases}, k \in \mathbb{Z}$$

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

$$x = \begin{cases} \frac{\pi}{2} + \pi k \\ \pi/4 + \pi k \end{cases}, k \in \mathbb{Z}$$

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

$$x = \begin{cases} \frac{\pi}{3} + 2\pi k \\ \frac{5\pi}{3} + 2\pi k \end{cases}, k \in \mathbb{Z}$$

10. $2\sin x - \sin 2x = 0$

$$x = \pi k, k \in \mathbb{Z}$$

12. $2\cos^2 x + \cos^2 x - \cos x = 0$

$$x = \left\{ \frac{\pi}{3}, \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{3} \right\}$$

14. $\frac{\sin x}{\sin x - 1} = \frac{\sin^2 x}{\sin x + 3}$

$$x = \left\{ 0, \pi, \frac{3\pi}{2}, 2\pi \right\}$$

16. $\cos 2x \cos x - \sin 2x \sin x = \frac{-\sqrt{3}}{2}$

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

$$f(x) = \int_0^x \frac{1}{1+t^2} dt$$

$$f(x) = \arctan x$$

$$f(x) = \arctan x$$

$$f(x) = \arctan x$$

$$f(x) = \arctan x$$

$$f(x) = \arctan x$$

$$f(x) = \arctan x$$

$$f(x) = \arctan x$$