

5.5 Inverse Trigonometric Functions

Evaluate each expression without using a calculator, and write your answers in radians.

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

2. $\cos^{-1}\left(\frac{1}{2}\right)$

3. $\cos^{-1}(-1)$

4. $\cos^{-1}(0)$

5. $\tan^{-1}(1)$

6. $\tan^{-1}(0)$

7. $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

8. $\cos^{-1}(1)$

9. $\sin^{-1}\left(-\frac{1}{2}\right)$

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

11. $\tan^{-1}(\sqrt{3})$

12. $\tan^{-1}\left(\frac{\sqrt{3}}{3}\right)$

13. $\sin^{-1}\left(-\frac{\text{sqrt}3}{2}\right)$

14. $\cos^{-1}\left(-\frac{1}{2}\right)$

15. $\cos^{-1}\left(\frac{3}{2}\right)$

Use a calculator to evaluate each expression to the nearest tenth of a degree.

16. $\sin^{-1}(0.1702)$

17. $\arcsin(0.1702)$

18. $\cos^{-1}(-0.8425)$

19. $\arccos(0.8425)$

20. $\tan^{-1}(0.3799)$

21. $\arctan(-0.3799)$

22. $\arctan(-2.748)$

Evaluate without using a calculator.

23. $\cos\left(\tan^{-1}\frac{3}{4}\right)$

24. $\tan\left(\sin^{-1}\frac{3}{5}\right)$

25. $\sin\left(\cos^{-1}\frac{5}{13}\right)$

26. $\cos\left(\tan^{-1}\frac{8}{15}\right)$

27. $\sin\left(\tan^{-1}\frac{24}{7}\right)$

For each expression below, write an equivalent expression that involves x only. (Assume x is positive.)

28. $\tan\left(\sin^{-1}\frac{x}{3}\right)$

29. $\sin\left(\cos^{-1}\frac{x}{2}\right)$

30. $\sec\left(\tan^{-1}\frac{x}{5}\right)$

Sketch the graph. Label the horizontal asymptotes.

31. $y = \frac{2}{\pi} \tan^{-1} x$

32. $y = 1 + \frac{2}{\pi} \tan^{-1} x$