

HW 4.3.6: Inverse Trigonometry

Sketch a graph of each function and identify the domain and range.

1. $f(x) = \sin x$

2. $f(x) = \sin^{-1} x$

3. $f(x) = \cos x$

4. $f(x) = \cos^{-1} x$

5. $f(x) = \tan x$

6. $f(x) = \tan^{-1} x$

Evaluate the following expressions.

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

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

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

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

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

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

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

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

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

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

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

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

Evaluate the following expressions.

19. $\sin^{-1}\left(\cos\left(\frac{\pi}{4}\right)\right)$

20. $\cos^{-1}\left(\sin\left(\frac{\pi}{6}\right)\right)$

21. $\sin^{-1}\left(\cos\left(\frac{4\pi}{3}\right)\right)$

22. $\cos^{-1}\left(\sin\left(\frac{5\pi}{4}\right)\right)$

23. $\cos\left(\sin^{-1}\left(\frac{3}{7}\right)\right)$

24. $\sin\left(\cos^{-1}\left(\frac{4}{9}\right)\right)$

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

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

Find a simplified expression for each of the following.

27. $\sin\left(\cos^{-1}\left(\frac{x}{5}\right)\right)$, for $-5 \leq x \leq 5$

28. $\tan\left(\cos^{-1}\left(\frac{x}{2}\right)\right)$, for $-2 \leq x \leq 2$

29. $\sin(\tan^{-1}(3x))$

30. $\cos(\tan^{-1}(4x))$