

- b) Using the calculator, we obtain $\cos^{-1}(-\frac{1}{2}) = 120^\circ = \frac{2\pi}{3}$. Note that this is *not* the same as the negative of $\cos^{-1}(\frac{1}{2}) = 60^\circ$, but the identity (19.3) holds: $\cos^{-1}(-\frac{1}{2}) = 180^\circ - \cos^{-1}(\frac{1}{2})$, that is, $120^\circ = 180^\circ - 60^\circ$.
- c) $\cos^{-1}(4.3)$ is undefined, since the domain of $y = \cos^{-1}(x)$ is $D = [-1, 1]$.

□

19.2 Exercises

✓ Exercise 19.1

Graph the function with the calculator. Use both radian and degree mode to display your graph. Zoom to an appropriate window for each mode to display a graph which includes the main features of the graph.

a) $y = \sin^{-1}(x)$ b) $y = \cos^{-1}(x)$ c) $y = \tan^{-1}(x)$

Exercise 19.2

Find the exact value of the inverse trigonometric function.

✓ a) $\tan^{-1}(\sqrt{3})$ ✓ b) $\sin^{-1}(\frac{1}{2})$ ✓ c) $\cos^{-1}(\frac{1}{2})$ ✓ d) $\tan^{-1}(0)$
 ✓ e) $\cos^{-1}(\frac{\sqrt{2}}{2})$ ✓ f) $\cos^{-1}(-\frac{\sqrt{2}}{2})$ ✓ g) $\sin^{-1}(-1)$ ✓ h) $\tan^{-1}(-\sqrt{3})$
 ✓ i) $\cos^{-1}(-\frac{\sqrt{3}}{2})$ j) $\sin^{-1}(-\frac{\sqrt{2}}{2})$ k) $\sin^{-1}(-\frac{\sqrt{3}}{2})$ l) $\tan^{-1}(-\frac{1}{\sqrt{3}})$

Exercise 19.3

Find the inverse trigonometric function value using the calculator. Approximate your answer to the nearest hundredth.

- For parts (a)-(f), write your answer in radian mode.

✓ a) $\cos^{-1}(0.2)$ ✓ b) $\sin^{-1}(-0.75)$ ✓ c) $\cos^{-1}(\frac{1}{3})$
 d) $\tan^{-1}(100,000)$ e) $\tan^{-1}(-2)$ f) $\cos^{-1}(-2)$

- For parts (g)-(l), write your answer in degree mode.

✓g) $\cos^{-1}(0.68)$ ✓h) $\tan^{-1}(-1)$ ✓i) $\sin^{-1}\left(\frac{\sqrt{2}+\sqrt{6}}{4}\right)$
j) $\tan^{-1}(100,000)$ k) $\cos^{-1}\left(\frac{\sqrt{2}-\sqrt{2}}{2}\right)$ l) $\tan^{-1}(2 + \sqrt{3} - \sqrt{6} - \sqrt{2})$