

Inverse Trig Functions

Name Key

Find the exact value of each expression.

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

2. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ $\frac{5\pi}{6}$

3. $\arcsin\left(\frac{1}{2}\right)$ $\frac{\pi}{6}$

4. $\operatorname{arccsc}\left(\frac{2}{\sqrt{3}}\right)$ $\frac{\pi}{3}$

5. $\csc^{-1}(\cos 0)$ $\frac{\pi}{2}$

6. $\cos\left(\operatorname{arcsec}\left(-\frac{2}{\sqrt{3}}\right)\right)$ $-\frac{\sqrt{3}}{2}$

7. $\csc(\sec^{-1} 2)$ $\frac{2}{\sqrt{3}}$

8. $\sin^{-1}\left(\cos\frac{3\pi}{2}\right)$ 0

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

10. $\arctan(\sec \pi)$ $-\frac{\pi}{4}$

11. $\cos\left(\tan^{-1}\left(-\frac{1}{4}\right)\right)$ $\frac{4}{\sqrt{17}}$

12. $\cot\left(\arccos\left(-\frac{2}{5}\right)\right)$ $-\frac{2}{\sqrt{21}}$

Write as an equivalent algebraic expression.

13. $\sin(\tan^{-1} x)$ $\frac{x}{\sqrt{x^2+1}}$

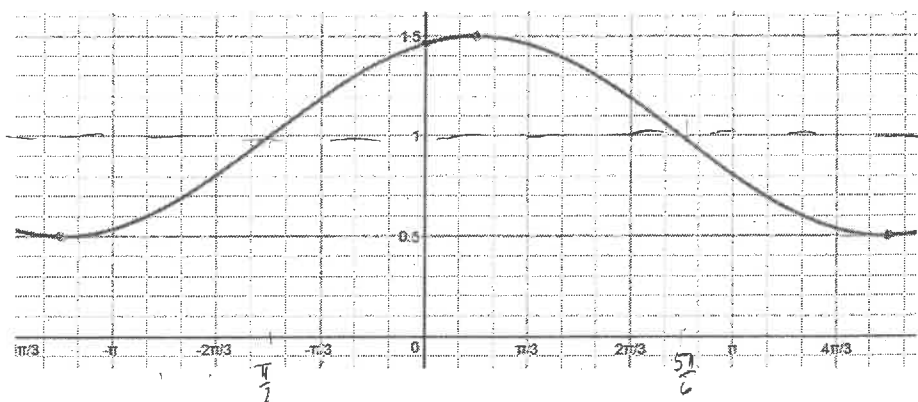
14. $\csc(\cot^{-1}(-3x))$ $\sqrt{9x^2+1}$

15. $\sec\left(\arccos\frac{2}{x}\right)$ $\frac{x}{2}$

16. $\tan(\arcsin(x-1))$ $\frac{x-1}{\sqrt{-x^2+2x}}$

Find a sine and cosine equations for each of the following curves.

17.

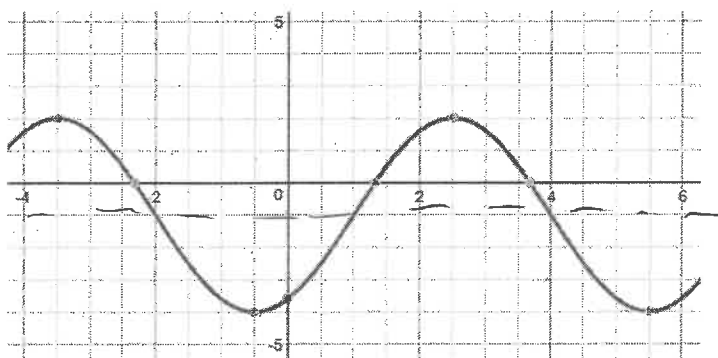


amp $\frac{1}{2}$
 vs $\uparrow 1$
 per $\frac{2\pi}{3} = \frac{2\pi}{b}$
 $2\pi \cdot \frac{3}{2\pi}$
 $b = \frac{3}{4}$

$$y = \frac{1}{2} \sin\left(\frac{3}{4}\left(x + \frac{\pi}{2}\right)\right) + 1$$

$$y = \frac{1}{2} \cos\left(\frac{3}{4}\left(x - \frac{\pi}{6}\right)\right) + 1$$

18.

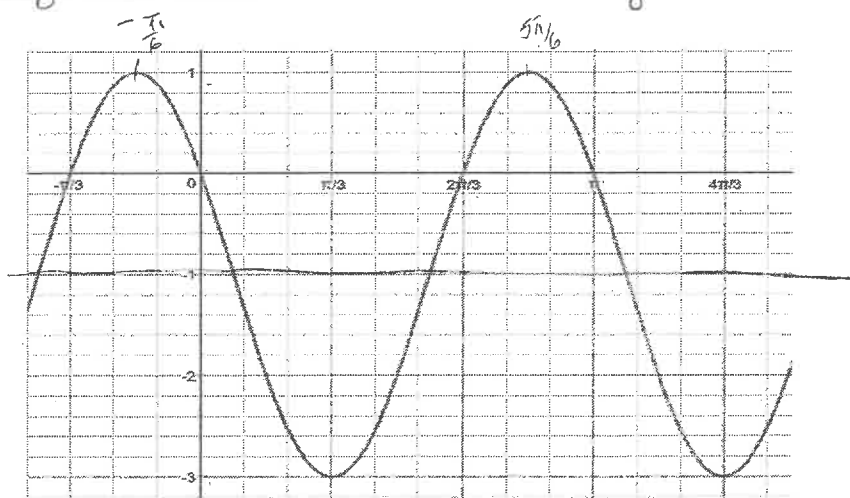


amp 3
 vs $\downarrow 1$
 per $\frac{\pi}{3} = \frac{\pi}{b}$
 $\frac{\pi}{3} = b$

$$y = -3 \sin\left(\frac{\pi}{3}(x + 2)\right) - 1$$

$$y = -3 \cos\left(\frac{\pi}{3}\left(x + \frac{1}{2}\right)\right) - 1$$

19.



amp 2
 vs $\downarrow 1$
 per π

$$y = -2 \sin\left(2\left(x + \frac{\pi}{2}\right)\right) - 1$$

$$y = 2 \cos\left(2\left(x + \frac{\pi}{2}\right)\right) - 1$$