

$$\sin \theta = \frac{0}{4}$$

$$\sin^{-1}\left(\frac{0}{4}\right) = \theta$$

**Practice With Inverse Trig Functions**

Find the exact value of the expression whenever it is defined.

1. a.  $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = \boxed{-\frac{\pi}{4}}$  b.  $\cos^{-1}\left(-\frac{1}{2}\right) = \boxed{\frac{2\pi}{3}}$  c.  $\tan^{-1}(-\sqrt{3}) = \boxed{-\frac{\pi}{3}}$

2. a.  $\sin^{-1}\left(-\frac{1}{2}\right) = \boxed{-\frac{\pi}{6}}$  b.  $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right) = \boxed{\frac{3\pi}{4}}$  c.  $\tan^{-1}(-1) = \boxed{-\frac{\pi}{4}}$

3. a.  $\arcsin \frac{\sqrt{3}}{2} = \frac{\pi}{3}$  b.  $\arccos \frac{\sqrt{2}}{2} = \boxed{\frac{\pi}{4}}$  c.  $\arctan \frac{1}{\sqrt{3}} = \boxed{\frac{\pi}{6}}$   
 $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \boxed{\frac{\pi}{3}}$

4. a.  $\arcsin 0 = \boxed{0}$  b.  $\arccos(-1) = \boxed{\pi}$  c.  $\arctan 0 = \boxed{0}$

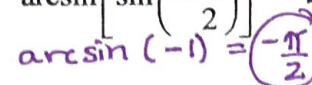
5. a.  $\sin^{-1}\left(\frac{0\pi}{H3}\right) = \text{undefined}$  b.  $\cos^{-1}\left(\frac{A\pi}{H2}\right) = \text{undefined}$  c.  $\tan^{-1}(1) = \boxed{\frac{\pi}{4}}$   
 $\triangle \pi$



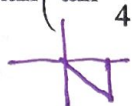
6. a.  $\arcsin\left(\frac{0\pi}{H2}\right) = \text{undefined}$  b.  $\arccos\left(\frac{A\pi}{H3}\right) = \text{undefined}$  c.  $\arctan\left(-\frac{\sqrt{3}}{3}\right) = \boxed{-\frac{\pi}{6}}$   
 $\tan^{-1}\left(-\frac{10}{\sqrt{3}}\right)$




7. a.  $\sin\left[\arcsin\left(\frac{0}{H10}\right)\right] = \frac{-3}{10}$  b.  $\cos\left[\arccos\left(\frac{1}{H2}\right)\right] = \boxed{\frac{1}{2}}$  c.  $\tan(\arctan 14) = \boxed{14}$   
 $\frac{-3}{10}$

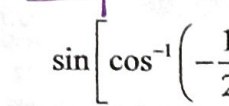
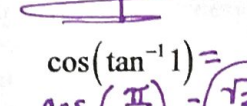
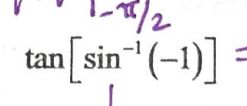
8. a.  $\sin\left[\sin^{-1}\left(\frac{20}{H3}\right)\right] = \boxed{\frac{2}{3}}$  b.  $\cos\left[\cos^{-1}\left(-\frac{1}{5}\right)\right] = \boxed{-\frac{1}{5}}$  c.  $\tan\left[\tan^{-1}\left(-\frac{9}{1}\right)\right] = \boxed{-9}$

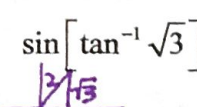
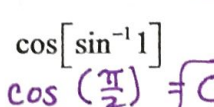
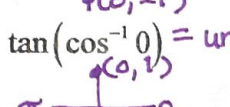
9. a.  $\sin^{-1}\left(\sin\frac{\pi}{3}\right) = \frac{\pi}{3}$  b.  $\cos^{-1}\left[\cos\left(\frac{5\pi}{6}\right)\right] = \frac{5\pi}{6}$  c.  $\tan^{-1}\left[\tan\left(-\frac{\pi}{6}\right)\right] = -\frac{\pi}{6}$

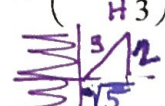

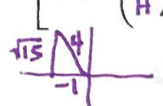
10. a.  $\arcsin\left[\sin\left(-\frac{\pi}{2}\right)\right]$  b.  $\arccos(\cos 0) = 0$  c.  $\arctan\left(\tan\frac{\pi}{4}\right) = \frac{\pi}{4}$   
 $\arcsin(-1) = -\frac{\pi}{2}$   


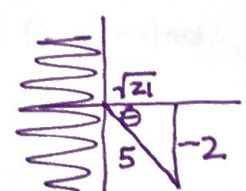
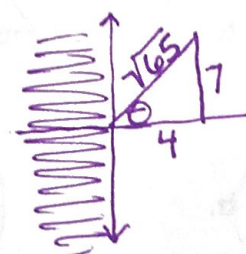
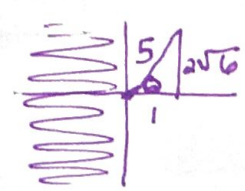
11. a.  $\arcsin\left(\sin\frac{5\pi}{4}\right) = -\frac{\pi}{4}$  b.  $\arccos\left(\cos\frac{5\pi}{4}\right) = \frac{3\pi}{4}$  c.  $\arctan\left(\tan\frac{7\pi}{4}\right) = -\frac{\pi}{4}$   
  
  


12. a.  $\sin^{-1}\left(\sin\frac{2\pi}{3}\right) = \frac{\pi}{3}$  b.  $\cos^{-1}\left(\cos\frac{4\pi}{3}\right) = \frac{2\pi}{3}$  c.  $\tan^{-1}\left(\tan\frac{7\pi}{6}\right) = \frac{\pi}{6}$   
  
  


13. a.  $\sin\left[\cos^{-1}\left(-\frac{1}{2}\right)\right] = \frac{\sqrt{3}}{2}$  b.  $\cos(\tan^{-1}1) = \frac{\sqrt{2}}{2}$  c.  $\tan[\sin^{-1}(-1)] = \text{undefined}$   
 $\cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$   
  
  


14. a.  $\sin[\tan^{-1}\sqrt{3}] = \frac{\sqrt{3}}{2}$  b.  $\cos[\sin^{-1}1] = 0$  c.  $\tan(\cos^{-1}0) = \text{undefined}$   
 $\cos\left(\frac{\pi}{2}\right) = 0$   
  
  


15. a.  $\cot\left(\sin^{-1}\frac{2}{3}\right) = \frac{\sqrt{5}}{2}$  b.  $\sec\left[\tan^{-1}\left(\frac{3}{4}\right)\right] = \frac{5}{4}$  c.  $\csc\left[\cos^{-1}\left(\frac{4}{5}\right)\right] = \frac{4}{3} \text{ or } \frac{4\sqrt{5}}{5}$   
 $2^2 + b^2 = 3^2$   
 $b^2 = 5$   
 $b = \sqrt{5}$   
  
  
  
 $4^2 + b^2 = 5^2$   
 $b^2 = 9$   
 $b = 3$

16. a.  $\cot\left[\sin^{-1}\left(-\frac{2}{5}\right)\right] = -\frac{\sqrt{21}}{2}$  b.  $\sec\left[\tan^{-1}\left(\frac{7}{4}\right)\right] = \frac{\sqrt{65}}{4}$  c.  $\csc\left[\cos^{-1}\left(\frac{1}{5}\right)\right] = \frac{5}{2\sqrt{6}} \text{ or } \frac{5\sqrt{6}}{12}$   
  
  
  
 $1^2 + b^2 = 5^2$   
 $b^2 = 24$   
 $b = 2\sqrt{6}$

$(-2)^2 + b^2 = 5^2$   
 $4 + b^2 = 25$   
 $b^2 = 21$   
 $b = \sqrt{21}$