

Exercises 9.4

1. (a) $\sin^{-1}\frac{1}{2} = \frac{\pi}{6}$ (b) $\cos^{-1}\frac{1}{2} = \frac{\pi}{3}$ (c) $\cos^{-1}2$ is not defined.
 3. (a) $\sin^{-1}\frac{\sqrt{2}}{2} = \frac{\pi}{4}$ (b) $\cos^{-1}\frac{\sqrt{2}}{2} = \frac{\pi}{4}$ (c) $\sin^{-1}(-\frac{\sqrt{2}}{2}) = -\frac{\pi}{4}$
 5. (a) $\sin^{-1}1 = \frac{\pi}{2}$ (b) $\cos^{-1}1 = 0$ (c) $\cos^{-1}(-1) = \pi$
 7. (a) $\tan^{-1}\frac{\sqrt{3}}{3} = \frac{\pi}{6}$ (b) $\tan^{-1}(-\frac{\sqrt{3}}{3}) = -\frac{\pi}{6}$ (c) $\sin^{-1}(-2)$ is not defined.

9. (a) $\sin^{-1}(0.7688) \approx 0.87696$

(b) $\cos^{-1}(-0.5014) \approx 2.09601$

11. $\sin(\sin^{-1}\frac{1}{3}) = \frac{1}{3}$

13. $\tan(\tan^{-1}10) = 10$

15. $\cos^{-1}(\cos\frac{\pi}{3}) = \frac{\pi}{3}$

17. $\sin^{-1}[\sin(-\frac{\pi}{6})] = -\frac{\pi}{6}$

19. $\tan^{-1}(\tan\frac{2\pi}{3}) = \tan^{-1}[\tan(\frac{2\pi}{3} - \pi)] = \tan^{-1}(\tan\frac{-\pi}{3}) = -\frac{\pi}{3}$ (since $\frac{2\pi}{3} > \frac{\pi}{2}$)

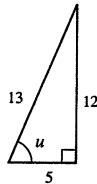
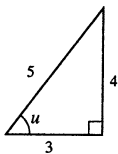
21. $\tan(\sin^{-1}\frac{1}{2}) = \tan\frac{\pi}{6} = \frac{\sqrt{3}}{3}$

23. $\cos(\sin^{-1}\frac{\sqrt{3}}{2}) = \cos\frac{\pi}{3} = \frac{1}{2}$

25. $\tan^{-1}(2\sin\frac{\pi}{3}) = \tan^{-1}(2 \cdot \frac{\sqrt{3}}{2}) = \tan^{-1}\sqrt{3} = \frac{\pi}{3}$

27. Let $u = \cos^{-1}\frac{3}{5}$, so $\cos u = \frac{3}{5}$. Then from the triangle $\sin(\cos^{-1}\frac{3}{5}) = \sin u = \frac{4}{5}$.

29. Let $u = \tan^{-1}\frac{12}{5}$, so $\tan u = \frac{12}{5}$. Then from the triangle $\sin(\tan^{-1}\frac{12}{5}) = \sin u = \frac{12}{13}$.



31. Let $\theta = \sin^{-1}\frac{12}{13}$, so $\sin\theta = \frac{12}{13}$. Then from the triangle $\sec(\sin^{-1}\frac{12}{13}) = \sec\theta = \frac{13}{5}$.

33. Let $u = \tan^{-1}2$, so $\tan u = 2$. Then from the triangle $\cos(\tan^{-1}2) = \cos u = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5}$.

