MATH 195

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§ 5.5 INVERSE TRIGONOMETRIC FUNCTIONS & GRAPHS

1, 2, 3, 5, 7, 24, 31, 33, 35, 37, 39, 47

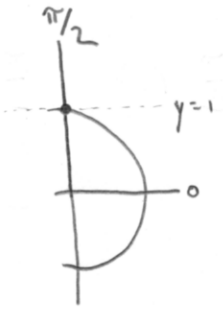
1. (a) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$, $\sin y = x$, $\frac{\pi}{6}$, $\sin\frac{\pi}{6} = \frac{1}{2}$

(b) $[0, \pi]$, $\cos y = x$, $\frac{\pi}{3}$, $\cos\frac{\pi}{3} = \frac{1}{2}$

2. $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

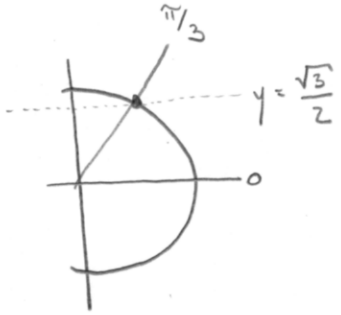
(ii) IS NOT TRUE BECAUSE $\frac{10\pi}{3}$ IS NOT IN THE INTERVAL $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$.

3. (a)



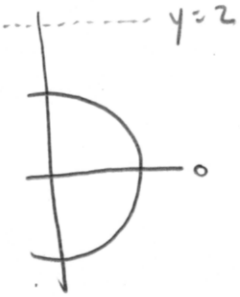
$\sin^{-1}(1) = \frac{\pi}{2}$

(b)



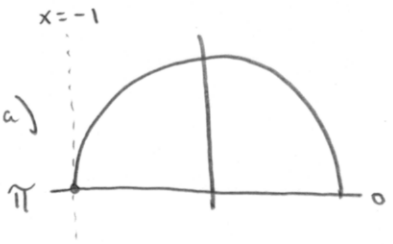
$\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{3}$

(c)



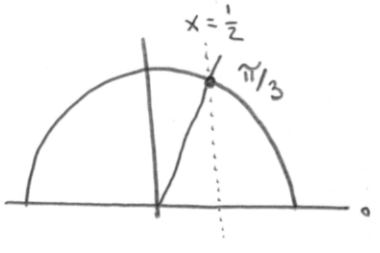
$\sin^{-1} 2$ = UNDEFINED

5. (a)



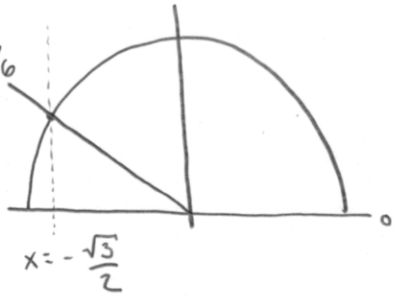
$\cos^{-1}(-1) = \pi$

(b)



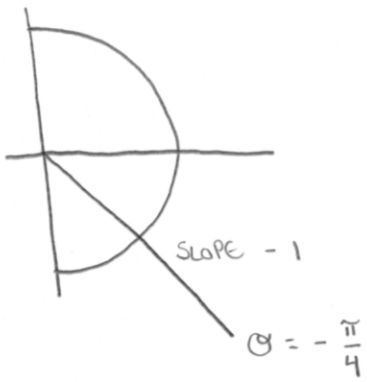
$\cos^{-1}\frac{1}{2} = \frac{\pi}{3}$

(c)



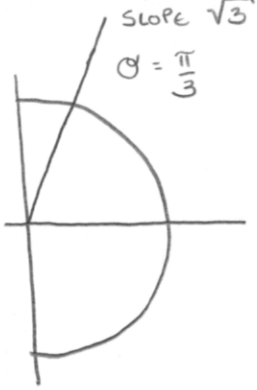
$\cos^{-1} -\frac{\sqrt{3}}{2} = \frac{5\pi}{6}$

7. (a)



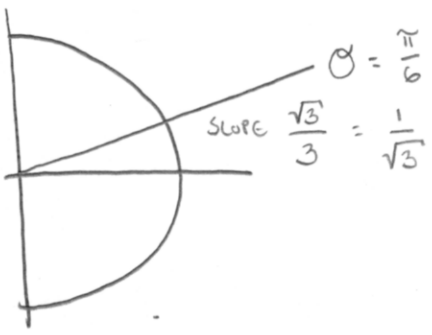
$\tan^{-1}(-1) = -\frac{\pi}{4}$

(b)



$\tan^{-1}\sqrt{3} = \frac{\pi}{3}$

(c)



$\tan^{-1}\frac{\sqrt{3}}{3} = \frac{\pi}{6}$

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

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

TWO WAYS OF THINKING ABOUT IT

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

$\sin^{-1}\frac{\sqrt{2}}{2} = \frac{\pi}{4}$

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

35. $\cos^{-1}\left(\cos\left(\frac{5\pi}{6}\right)\right) = \frac{5\pi}{6}$

37. $\cos^{-1}\left(\cos\left(\frac{7\pi}{6}\right)\right) = \begin{cases} \cos^{-1} -\frac{\sqrt{3}}{2} = -\frac{\pi}{6} \\ \cos^{-1}\left(\cos\left(-\frac{\pi}{6}\right)\right) = -\frac{\pi}{6} \end{cases}$

39. $\tan^{-1}\left(\tan\left(\frac{\pi}{4}\right)\right) = \frac{\pi}{4}$

47. $\sin\left(\tan^{-1}(-1)\right) = \sin\left(-\frac{\pi}{4}\right) = -\frac{\sqrt{2}}{2}$