Mat 1375 HW19

19.1 . please check classwork 20 & 21 for the graphs.

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

$-\frac{\pi}{2} < \tan^{-1}(x) < \frac{\pi}{2}$, $-\frac{\pi}{2} \le \sin^{-1}(x) \le \frac{\pi}{2}$, $0 \le \cos^{-1}(x) \le \pi$

(a) $\theta = \tan^{-1}(\sqrt{3}) \Rightarrow \tan(\theta) = \sqrt{3} \Rightarrow \frac{\sin(\theta)}{\cos(\theta)} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} \Rightarrow \theta = \frac{\pi}{3}$

(b) $\theta = \sin^{-1}(\frac{1}{2}) \Rightarrow \sin(\theta) = \frac{1}{2} \Rightarrow \theta = \frac{\pi}{6}$

(c) $\theta = \cos^{-1}(\frac{1}{2}) \Rightarrow \cos(\theta) = \frac{1}{2} \Rightarrow \theta = \frac{\pi}{3}$

(d) $\theta = \tan^{-1}(0) \Rightarrow \tan(\theta) = 0 \Rightarrow \theta = 0$

(e) $\theta = \cos^{-1}(\frac{\sqrt{2}}{2}) \Rightarrow \cos(\theta) = \frac{\sqrt{2}}{2} \Rightarrow \theta = \frac{\pi}{4}$

(f) $\theta = \cos^{-1}(-\frac{\sqrt{2}}{2}) \Rightarrow \cos(\theta) = -\frac{\sqrt{2}}{2} \Rightarrow \theta = \frac{3\pi}{4}$

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

(h) $\theta = \tan^{-1}(-\sqrt{3}) \Rightarrow \tan(\theta) = -\sqrt{3} \Rightarrow \theta = -\frac{\pi}{3}$

(i) $\theta = \cos^{-1}(-\frac{\sqrt{3}}{2}) \Rightarrow \cos(\theta) = -\frac{\sqrt{3}}{2} \Rightarrow \theta = \frac{5}{6}\pi$

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) $\cos^{-1}(\frac{1}{3})$

(a) $\cos^{-1}(0.2) = 1.37$ (b) $\sin^{-1}(-0.75) = -0.85$

(c) $\cos^{-1}(\frac{1}{3}) = 1.23$

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

g) $\cos^{-1}(0.68)$ h) $\tan^{-1}(-1)$ i) $\sin^{-1}(\frac{\sqrt{2}+\sqrt{6}}{4})$

(g) $\cos^{-1}(0.68) = 47.63°$ (h) $\tan^{-1}(-1) = -45°$ (i) $\sin^{-1}(\frac{\sqrt{2}+\sqrt{6}}{4}) = 75°$