Section 6.5

I) Find the exact value of the following

1) $\sin^{-1}\dfrac{1}{\sqrt{2}}$ **2)** $\cos^{-1}(-\dfrac{\sqrt{3}}{2})$ **3)** $\tan^{-1}\sqrt{3}$ **4)** $\tan^{-1}(-\dfrac{1}{\sqrt{3}})$ **5)** $\cos^{-1}(-1)$ **6)** $\cos^{-1}(-\dfrac{1}{2})$ **7)** $\tan^{-1}0$ **8)** $\sin^{-1}(-1)$

9) $\cos^{-1}1$ **10)** $\cos^{-1}0$ **11)** $\sin^{-1}(-\dfrac{1}{2})$ **12)** $\tan^{-1}(-1)$

II) Find the exact value of each expression

1) $\sin[\cos^{-1}(-\dfrac{1}{\sqrt{2}})]$ **2)** $\cos[\sin^{-1}(-\dfrac{\sqrt{3}}{2})]$ **3)** $\sin^{-1}(\sin(-\dfrac{11\pi}{6}))$ **4)** $\cos^{-1}(\cos\dfrac{23\pi}{18})$ **5)** $\tan^{-1}(\tan\dfrac{16\pi}{9})$

6) $\sin^{-1}(\sin\dfrac{19\pi}{15})$ **7)** $\cos^{-1}(\cos\dfrac{9\pi}{5})$ **8)** $\tan^{-1}(\tan\dfrac{8\pi}{7})$ **9)** $\sin^{-1}(\sin\dfrac{31\pi}{18})$ **10)** $\cos^{-1}[\cos(-\dfrac{7\pi}{15})]$ **11)** $\sin^{-1}(\sin\dfrac{9\pi}{10})$

12) $\tan^{-1}[\tan(-\dfrac{\pi}{20})]$ **13)** $\sin[\sin^{-1}(-b)]$, $-1<b<0$ **14)** $\cos[\cos^{-1}(-\dfrac{b}{a})]$, $a<b$ **15)** $\tan[\tan^{-1}(-\dfrac{2}{\sqrt{3}})]$

16) $\cos(\cos^{-1}\dfrac{2}{3})$ **17)** $\cos[\cos^{-1}(-\dfrac{1}{10})]$ **18)** $\sin[\sin^{-1}(-\dfrac{2}{\sqrt{3}})]$ **19)** $\sin(\sin^{-1}\dfrac{\sqrt{2}}{2})$ **20)** $\tan[\tan^{-1}(-\dfrac{\sqrt{2}}{2})]$

21) $\tan(\tan^{-1}\dfrac{23\pi}{15})$ **22)** $\sec[\sin^{-1}(-\dfrac{b}{a})]$, $a>b$ **23)** $\csc[\cos^{-1}(-\dfrac{2}{5})]$ **24)** $\sin[\tan^{-1}(-\dfrac{1}{a})]$, $a>0$ **25)** $\cot[\sin^{-1}(-\dfrac{3}{5})]$

26) $\cos(\tan^{-1}\dfrac{\sqrt{2}}{2})$ **27)** $\sin(\cos^{-1}\dfrac{1}{\sqrt{3}})$ **28)** $\cos(\sin^{-1}\sqrt{3})$ **29)** $\sin^{-1}(-\dfrac{1}{2})+2\cos^{-1}(-\dfrac{\sqrt{3}}{2})$

30) $\cot[\sin^{-1}(-\dfrac{\sqrt{2}}{2})-\cos^{-1}(0)]$ **31)** $\sec[2\tan^{-1}(-1)-\cos^{-1}(-\dfrac{1}{2})]$ **32)** $\csc[\sin^{-1}(-\dfrac{12}{13})-\dfrac{11\pi}{2}]$

33) $\cot[\cos^{-1}(-\dfrac{8}{17})-3\pi]$ **34)** $\sin[6\pi-\cos^{-1}(-\dfrac{1}{2})]$ **35)** $\tan[\dfrac{5\pi}{2}+\sin^{-1}(-\dfrac{3}{5})]$ **36)** $\sin[\cos^{-1}(-\dfrac{1}{\sqrt{2}})-\dfrac{9\pi}{4}]$

37) $\cos[\tan^{-1}(-\sqrt{3})-\dfrac{5\pi}{6}]$ **38)** $\cot[\sin^{-1}(-\dfrac{1}{2})-\dfrac{5\pi}{3}]$ **39)** $\csc[\cos^{-1}(-\dfrac{\sqrt{3}}{2})-\dfrac{7\pi}{2}]$ **40)** $\cot[\dfrac{9\pi}{2}-\sin^{-1}(-\dfrac{1}{\sqrt{2}})]$

41) $\sec[\tan^{-1}(-\dfrac{1}{\sqrt{3}})-7\pi]$ **42) solve** $\sin^{-1}(\dfrac{2x}{3}+\dfrac{1}{2})=-\dfrac{\pi}{6}$ **43) solve** $\cos^{-1}(\dfrac{x}{\sqrt{2}}+3\sqrt{2})=\dfrac{3\pi}{4}$

44) solve $\tan^{-1}(\sqrt{3}-\dfrac{4x}{3})=-\dfrac{\pi}{3}$ **45) solve** $\sin^{-1}(1-x-x^2)=-\dfrac{\pi}{2}$

Section 6.6: Solve over $[-\pi,\dfrac{3\pi}{2}]$

1) $\sin\theta=-\dfrac{\sqrt{3}}{2}$ **2)** $\tan\theta=-1$ **3)** $\cos\theta=\dfrac{\sqrt{3}}{2}$ **4)** $\csc\theta=2$ **5)** $\cot\theta=\dfrac{1}{\sqrt{3}}$ **6)** $\tan 2\theta=0$ **7)** $\sin 3\theta=1$

8) $\cos 2\theta=-\dfrac{1}{2}$ **9)** $\sin\dfrac{\theta}{2}=\dfrac{1}{2}$ **10)** $\tan\dfrac{\theta}{2}=-\sqrt{3}$ **11)** $\cos(2\theta-\dfrac{\pi}{2})=-1$ **12)** $\sin(\theta-\pi)=-\dfrac{1}{2}$

13) $\tan(2\theta-\dfrac{\pi}{4})=1$ **14)** $\sin(2\theta+\dfrac{\pi}{3})=-\dfrac{\sqrt{3}}{2}$ **15)** $\cos(2\theta-\dfrac{\pi}{6})=-\dfrac{\sqrt{2}}{2}$ **16)** $\tan\dfrac{3\theta}{2}=1$ **17)** $\tan 2\theta=-\dfrac{1}{\sqrt{3}}$

Section 6.7: Solve over $[-\pi, 2\pi)$ [find the number of solution over the given interval]

1) $2\cos^2\theta = \sqrt{3}\cos\theta$ **2)** $\sin\theta + \sin 2\theta = 0$ **3)** $2\cos^2\theta + \sin\theta = 2$ **4)** $\sin^2\theta - 2\sin\theta = 3$ **5)** $\sqrt{3}\sin 2\theta + \cos\theta = 0$

6) $2\sin\theta + \csc\theta - 3 = 0$ **7)** $\sec^2\theta = 1 + \sqrt{3}\tan\theta$ **8)** $2\cos^2\theta + 3\cos\theta - 2 = 0$ **9)** $\sec^2\theta - 4 = 0$ **10)** $\sin\theta = \tan\theta$

11) $2\sin^2\theta + \sin\theta - 6 = 0$ **12)** $2\cos^3\theta - \cos\theta = 0$ **13)** $\sin^2\theta = \sin 2\theta$ **14)** $\cos 2\theta + \cos\theta - 2 = 0$

15) $\tan\theta + \cot\theta + 2 = 0$ **16)** $3\cot^2\theta + 1 = 0$ **17)** $\cos^2\dfrac{\theta}{2} = \dfrac{1}{4}$ **18)** $\sin^2\theta - \cos^2\theta = 1$ **19)** $\sin^2\theta - \cos^2\theta = 0$

20) $\csc^2\theta = 2\cot\theta$ **21)** $\sin^2\dfrac{\theta}{2} = \cos^2\theta$ **22)** $2\csc^2\theta - 1 = 0$ **23)** $\cos\theta = \sin^2\theta\cos\theta$

24) $3\sec^2\theta - 2\sec\theta - 1 = 0$ **25)** $\tan\theta\cos\theta + \tan\theta = 0$ **26)** $3\sin\theta - 2 - \csc\theta = 0$