Answers [4 Mark Question]

1) a) $c = 60^0$ b) $\text{Cos}^{-1}(5/6)$ c) 90^0 d) -77/2 e) I) 22 ii) $\sqrt{145}$ f) 8

2) a) $2^{1/3}\,\text{cis}\left(\frac{12n\pi-\pi}{18}\right)$ b) $(\sqrt{2})^{\frac{1}{3}}\,\text{cis}\left(\frac{8n\pi+3\pi}{12}\right)$

c) $\text{cis}\left(\frac{6n\pi-\pi}{9}\right)$ d) $(2\sqrt{2})^{\frac{1}{3}}\,\text{cis}\left(\frac{8n\pi+3\pi}{12}\right)$

e) $2\,\text{cis}\left(\frac{12n\pi-5\pi}{18}\right)$ Here n =0,1,2,

3) a) $2^{\frac{1}{4}}\,\text{cis}\left(\frac{12n\pi-\pi}{24}\right)$ b) $(\sqrt{2})^{\frac{1}{4}}\left(\text{cis}\,\frac{8n\pi+3\pi}{16}\right)$

c) $2^{\frac{1}{4}}\,\text{cis}\left(\frac{6n\pi+\pi}{12}\right)$ d) $\sqrt{2}\,\text{cis}\left(\frac{4n\pi-\pi}{8}\right)$

Here n= 0,1,2,3

4) a) $2^{\frac{1}{3}}\,\text{cis}\left(\frac{12n\pi+5\pi}{18}\right)$, Continued Product $= -\sqrt{3}+i$

b) $(\sqrt{2})^{\frac{1}{3}}\,\text{cis}\left(\frac{8n\pi-5\pi}{12}\right)$, Continued Product = 1-i

c) $4^{\frac{1}{3}}\,\text{cis}\left(\frac{6n\pi-2\pi}{9}\right)$, Continued Product $= -2-2\sqrt{3}\,i$

Here : n= 0,1,2

5) a) $(\sqrt{2})^{\frac{1}{4}}\,\text{cis}\left(\frac{8n\pi-5\pi}{16}\right)$, Continued Product = 1+i

b) $4^{\frac{1}{4}}\,\text{cis}\left(\frac{6n\pi-\pi}{12}\right)$, Continued Product $= -2+2\sqrt{3}\,i$

c) $2^{\frac{1}{4}}$ cis $\left(\frac{12n\Pi+5\Pi}{24}\right)$, Continued Product = $\sqrt{3}$ -i

d) cis $\left(\frac{6n\Pi+2\Pi}{12}\right)$, Continued Product = $\frac{1}{2}$ - i $\frac{\sqrt{3}}{2}$

Here n = 0,1,2,3

6) a) $\sqrt{2}$ b) $3\sqrt{2}$ c) $\frac{21}{\sqrt{26}}$

7)

a) $\frac{1}{a}$ [-cosax+ $\frac{\cos^3 ax}{3}$

b) $\frac{1}{a}$ [sinax- $\frac{\sin^3 ax}{3}$

c) $\frac{1}{a}\left[\frac{\tan^2 ax}{2} - \log_e(\sec ax)\right]$

d) $\frac{1}{a}\left[-\frac{-\cot^2 ax}{2} - \log_e(\sin x)\right]$

e) $\frac{1}{2a}$ [tanax secax + $\log_e$(secax+ Tanax)]

f) $\frac{1}{2a}$ [-cosecax cotax + $\log_e$(cosecax-cotax)]

g) $\frac{1}{a}\left[\frac{3ax}{8} + \frac{sin4ax}{32} - \frac{sin2ax}{4}\right]$

h) $\left[\frac{1}{a}\ \frac{3ax}{8} + \frac{sin4ax}{32} + \frac{sin2ax}{4}\right]$

i) $\frac{1}{a}\left(\frac{\tan^3 ax}{3} + \tan ax + ax\right)$

j) $\frac{1}{a}\left(\frac{\cot^3 ax}{3} + \cot ax + ax\right)$

k) $\frac{1}{a}\left(\text{Tanax} + \frac{\tan^3 ax}{3}\right)$

l) $\frac{1}{a}\left(-\text{cotax} - \frac{\cot^3 ax}{3}\right)$

m) $\frac{1}{4}\left(-\cos 4x + \frac{\cos^3 4x}{3}\right)$

n) $\frac{1}{5}\left(\text{Tan}5x + \frac{\tan^3 5x}{3}\right)$

Here add c at the end to all answers

Answers [2 marsks Question]

1) a) 3 b) 1 c) 12 d) 2 e) 3

2) a) 7 b) 3 c) 9

3) a) 11 b) 2

5) a) $x \equiv 4 \pmod 5$, b) $x \equiv 3 \pmod 9$,

c) $x \equiv 2 \pmod 9$,$x \equiv 5 \pmod 9$,$x \equiv 8 \pmod 9$,

d) $x \equiv 2 \pmod 8$, $x \equiv 6 \pmod 8$,

6) a) $\cot x \log_5 e$ b) $\frac{\cot x}{2} \log_{10} e$ c) $-\frac{\tan x}{2} \log_6 e$

d) $\frac{1}{\tan x} \sec^2 x \log_4 e$ e) $\frac{\operatorname{cosec}^2 x}{2\cot x} \log_{10} e$

f) $\frac{x+1}{x^2+2x+1} \log_5 e$ g) $\tanh x \log_6 e$

7) a) $\cos\left(\frac{3\pi x}{180}\right) \frac{3\pi}{180}$ b) $-\sin\left(\frac{\pi x}{90}\right) \frac{\pi}{90}$

c) $\sec^2\left(\frac{5\pi x}{180}\right) \frac{5\pi}{180}$

d) $2 \sin\left(\frac{\pi x}{90}\right) \cdot \cos\left(\frac{\pi x}{90}\right) \frac{\pi}{90}$

e) $2 \cos\left(\frac{\pi a x}{180}\right) \left(-\sin\left\{\frac{\pi a x}{180}\right\} \frac{\pi a}{180}\right)$

f) $2 \cot\left(\frac{\pi x}{180}\right) \left(-\operatorname{cosec}^2\left\{\frac{\pi x}{180}\right\} \frac{\pi}{180}\right)$

8) a) 1 b) $\frac{5}{2}$ c) 3 d) $\frac{3}{2}$ e) 1 f) 2

9) a) degre = 2, order =2

b) degre = 3, order =2

c) degre = 1, order =3