Q:- 1

Sol:- $y=e^{((cot)-1x4)7}$

$Dy/dx=(cot^{-1}x^4)^7 e^{(cot-1x4)7}$ $dy/dx(cot^{-1}x^4)^7$

$=(cot^{-1}x^4)^7 e^{(cot^{-1}x^{4)}} 7(cot^{-1}x^4)^6$ $dy/dx\ (cot^{-1}x^4)$

$=7(cot^{-1}x^4)^7 e^{(cot-1\ x4)7}$ $(cot^{-1}x^4)^6$ $-1/1+x^8.4x^3$

$=-28x^3/1+x^8(cot^{-1}x^4)^{13}$ $e^{(cot-1\ x4)7........}$

Q2:-

Ans:- divide num, & denominator by x^2

$d/x\rightarrow\infty$ $x^2[39+7/x]/x^2[54+19/x^2]$

$=39+7/\infty/54+19/\infty=39+0/54+0$

=13/18 ans....

Q3:

Sol:- if f(x)= { 12 if x is an integer

-7 if x is a real no. which is not an integer

Sol:

This function is discontinues at x=9 because it take value 12 if x is an integer

It take value -7 if x is real no which is not an integer

So it is in continous.

Q4:-

Ans:- $f(x)= 12\ x^6-4\ x^4-1$

$F`(x)=72x^5-16x^3+45x^2$

For maxima & minima, we have

F`(x)=0

$72x^5-16x^3+45x^2=0$

$X^2[72x^3-16x+45]=0$

For minima,

$F``(x)=360x^4-48x^2+90x>0$

$3x(120x^3-16x+30)>0$

$6x[60x^{3+-}8x+15)>0$

For maxima

$F``(x)<0$

Q5:

Sol:- $3x^3-5x^2+2x+5=0$

$\alpha+\beta+\gamma=5/3$-----------------------------------(1)

$\alpha\beta+ \beta\gamma+ \alpha\gamma=2/3$-----------------------------(2)

$\alpha\beta\gamma=-5/3$-------------------------------------(3)

now we have to final

$\alpha^2+\beta^2+ \alpha\beta, \beta^2+\gamma^2+ \beta\gamma, \alpha^2+\gamma^2+ \alpha\gamma$

adding

$\alpha^2+\beta^2+ \alpha\beta, \beta^2+\gamma^2+ \beta\gamma, \alpha^2+\gamma^2+ \alpha\gamma$

2($\alpha^2+\beta^2+\gamma^2)+ \alpha\beta+ \beta\gamma+ \alpha\gamma$

$2(\alpha^2+\beta^2+\gamma^2)+2/3=5/3$

$2(\alpha^2+\beta^2+\gamma^2)=1$

$A^2+\beta^2+\gamma^2=1/2$

Q6:-

Sol:-

$\int\tan^7x\ dx$

$=\int\tan^7x.1\ dx$ integration by parts

$=[x\text{-}\tan^7 x]- \int 1.x\ dx/1+x^2$

$X \tan^7 x -1/2\int 2x\ dx/2x\ dx/1+x^2$

$X \tan^7 x – ½ \log (1+x^2)+c$ where c is a constant.

Q 7:-

Ans:- $r \cos θ =3$.

$r\sin θ=4$

$r^2=9+16 =25$

$r=5$

$\tan θ$**$=4/3$, $θ=\tan x^7 4/3$**

nth root

$z=(r\cos θ$**$+r\sin θ$**$)$

$3+4i=r[\cos θ$**$+2k\pi/n \quad +i\sin(θ+2k\pi/n)]$**

$3+4i=r\cos θ+2k\pi/7 +i\sin θ+2k\pi/7$

Put $k=[-4,-2,-1,0,1,2,3]$

Q:8

Area bounded by the curve $y=e^{2x,\ the}$ coordinates $x=4$, & $x=7$

$\int^b_a y\ dx$ **=** $\int^7_4 e^{2x}\ dx$

$=e^{2x}/2 \quad \int^7_4\text{-}e^{2x7}/2 - e^{2x4}/2$

$=e^{14}/2 – e^8/2.$

Q9:

(a) Sol: equation of the line joining two points

(-7,6,-3) & (7,-6,3)

$X+7/14 =y-6/-12$

$=z+3/6$

(b) Sol: any sphere is given

$X^2+y^2+z^2-18+k(3x+3y+3z-11)=0$, $k \in R$

Its center = $(-3k/2, -3k/2,-3k/2)$

Its distance from origin ie: $(0,0,0)$