

SNS COLLEGE OF TECHNOLOGY

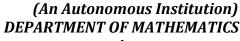


DEPARTMENT OF MATHEMATICS



Note: 1) tayler series of fix) at z o is called mail. Sories. a) $(1-x)^{-1} = 1+x+x^{2}+x^{3}+.$ $(1+x)^{-1} = 1 - x + x^2 + ... + ...$ (1+x)² = 1-2x + 3x²-4x³+... $(1-x)^{-2} = 1+2x+3x^2+4x^3+...$ 1) expand y(2) = log(112) as layler series about the point z= 0 Derviscative. f(z) = log (1+2) f(0) = log (1+0) = 0 f(z) = log (1+ z) 1 (z) = _____ /(z) = 1 () $\int_{(1+2)^{2}}^{(1+2)^{2}} \int_{(0)^{2}}^{(0)^{2}} = -1$ $\beta'''(z) = \frac{2}{(1+z)^3}$ $\beta'''(0) = 2$ = $f(0) + (z-a) = f'(0) + (z-a)^2 f''(0) + (z-a)^3 f'''(0)$ $= 0 + z(1) + \frac{z^2}{2}(-1) + \frac{z^3}{4} \times 2^{2}$ $= Z = \frac{z^2}{2} + \frac{z^3}{3} + \dots$ 2) Expand $f(z) = e^{z}$ as stayler sories z = 0Dervivative $p_{12} = e^{2}$ $f(z) = e^{2}$ f(z) = 1(0) 23 . 13







f'(0) = 1 $f'(z) = e^{Z}$ $f''(z) = a^{Z}$ $f''(z) = a^{Z}$ f'''(z) = 1 $\mathcal{J}^{(1)}(z) = a^{Z}$ $f(z) = f(0) + \frac{(z)}{1!} f'(0) + \frac{z^2}{2!} f''(0) + \frac{z^3}{3!} f'''(0) + \dots$ $= 1 + z(+0)z^{2} + z^{3} + \cdots$ $= 1 + z + \frac{z^2}{2} + \frac{z^3}{L} + \cdots$ 3) Expand $f(z) = \cos z$ about the point $z = \frac{17}{3}$ Derivative $Derivative of z = \frac{17}{3}$ $b(z) = \cos z$ () $b(\pi/3) = \cos \pi/3 = 1/2$ $\begin{aligned} & \int f'(z) = -\sin z & & \int f'(T_3) = -\sin T_3 = -\frac{\sqrt{3}}{2} \\ & \int f''(z) = -\cos z & & \int f''(T_3) = -\cos T_3 = -\frac{\sqrt{3}}{2} \\ & \int f'''(z) = \sin z & & \int f'''(T_3) = -\sin \frac{T_3}{3} = -\frac{\sqrt{3}}{2} \end{aligned}$ $f''(z) = -\cos z$ $b(x) = b(\frac{1}{3}) + \frac{(2 - \frac{1}{3})}{11} b'(\frac{1}{3}) + \frac{(2 - \frac{1}{3})}{11} b'(\frac{1}{3})$ + $(z - \frac{17}{3})^3 g^{11}(\frac{17}{3}) + \cdots$ $= \frac{1}{2} + (z - \frac{\pi}{3}) - \frac{13}{2} + \frac{[z - \frac{\pi}{3}]^{2}}{2} + \frac{[z - \frac{\pi}{3}]^{2}}{2} + \frac{[z - \frac{\pi}{3}]^{2}}{2} + \frac{1}{2} + \frac{1}{2}$ $= \frac{1}{2} - \frac{13}{2} \left(\frac{z - \frac{11}{3}}{3} \right) - \left(\frac{z - \frac{11}{3}}{3} \right)^2 \left(\frac{-1}{2} \right) + \left(\frac{z - \frac{17}{3}}{6} \right)^3 \frac{1}{2}$