Desarrollar por Mc Laurin $f_{(x)}=\ln(x+3)$

$f_{(x)}=\ln(x+3)$ $\qquad f_{(0)}=\ln 3$

$f'_{(x)}=\frac{1}{(x+3)}=(x+3)^{-1}$ $\qquad f'_{(0)}=\frac{1}{3}$

$f''_{(x)}=-(x+3)^{-2}$ $\qquad f''_{(0)}=-\frac{1}{9}$

$f'''_{(x)}=2(x+3)^{-3}$ $\qquad f'''_{(0)}=\frac{2}{27}$

$f^{(4)}{}_{(x)}=-6(x+3)^{-4}$ $\qquad f^{(4)}{}_{(0)}=\frac{-6}{81}=\frac{-2}{27}$

Desarrollamos:

$$f_{(x)}=\sum_{n=o}^{\infty}\frac{f^{(n)}{}_{(0)}}{n!}\cdot x^n$$

$$f_{(x)}=\frac{f^{(0)}{}_{(0)}}{0!}\cdot x^0+\frac{f'_{(0)}}{1!}\cdot x^1+\frac{f''_{(0)}}{2!}\cdot x^2+\frac{f'''_{(0)}}{3!}\cdot x^3+\frac{f^{(4)}{}_{(0)}}{4!}\cdot x^4+\ldots$$

$$f_{(x)}=\frac{\ln 3}{0!}\cdot x^0+\frac{\frac{1}{3}}{1!}\cdot x^1+\frac{-\frac{1}{9}}{2!}\cdot x^2+\frac{\frac{2}{27}}{3!}\cdot x^3+\frac{-\frac{2}{27}}{4!}\cdot x^4+\ldots$$

$$\boxed{f_{(x)}=\ln 3+\frac{1}{3}\cdot x-\frac{1}{9}\cdot x^2+\frac{2}{162}\cdot x^3-\frac{2}{648}\cdot x^4+\ldots}$$

$f_{(x)}=-e^{-x}$

$f_{(x)}=-e^{-x}$ $\qquad f_{(0)}=-1$

$f'_{(x)}=e^{-x}$ $\qquad f'_{(0)}=1$

$f''_{(x)}=-e^{-x}$ $\qquad f''_{(0)}=-1$

$f'''_{(x)}=e^{-x}$ $\qquad f'''_{(0)}=1$

$f^{(4)}{}_{(x)}=-e^{-x}$ $\qquad f^{(4)}{}_{(0)}=-1$

Desarrollamos:

$$f_{(x)}=\sum_{n=o}^{\infty}\frac{f^{(n)}{}_{(0)}}{n!}\cdot x^n$$

$$f_{(x)}=\frac{f^{(0)}{}_{(0)}}{0!}\cdot x^0+\frac{f'_{(0)}}{1!}\cdot x^1+\frac{f''_{(0)}}{2!}\cdot x^2+\frac{f'''_{(0)}}{3!}\cdot x^3+\frac{f^{(4)}{}_{(0)}}{4!}\cdot x^4+\ldots$$

$$f_{(x)}=\frac{-1}{0!}\cdot x^0+\frac{1}{1!}\cdot x^1+\frac{-1}{2!}\cdot x^2+\frac{1}{3!}\cdot x^3+\frac{-1}{4!}\cdot x^4+\ldots$$

$$\boxed{-e^{-x}=-1+x-x^2+x^3-x^4+\ldots}$$

$$f_{(x)} = \ln(x+1)$$

$$f_{(x)} = \ln(x+1) \qquad f_{(0)} = \ln 1 = 0$$

$$f'_{(x)} = \frac{1}{x+2} = (x+2)^{-1} \qquad f'_{(0)} = \frac{1}{2}$$

$$f''_{(x)} = -(x+2)^{-2} \qquad f''_{(0)} = -\frac{1}{4}$$

$$f'''_{(x)} = 2(x+2)^{-3} \qquad f'''_{(0)} = \frac{1}{4}$$

$$f^{(4)}{}_{(x)} = -6(x+2)^{-4} \qquad f^{(4)}{}_{(0)} = \frac{-3}{8}$$

Desarrollamos:

$$f_{(x)} = \sum_{n=o}^{\infty} \frac{f^{(n)}{}_{(0)}}{n!} \cdot x^n$$

$$f_{(x)} = \frac{f^{(0)}{}_{(0)}}{0!} \cdot x^0 + \frac{f'_{(0)}}{1!} \cdot x^1 + \frac{f''_{(0)}}{2!} \cdot x^2 + \frac{f'''_{(0)}}{3!} \cdot x^3 + \frac{f^{(4)}{}_{(0)}}{4!} \cdot x^4 + \ldots$$

$$f_{(x)} = \frac{0}{0!} \cdot x^0 + \frac{\frac{1}{2}}{1!} \cdot x^1 + \frac{-\frac{1}{4}}{2!} \cdot x^2 + \frac{\frac{1}{4}}{3!} \cdot x^3 + \frac{-\frac{3}{8}}{4!} \cdot x^4 + \ldots$$

$$\boxed{\ln(x+1) = \frac{1}{2}x - \frac{1}{4}x^2 + \frac{1}{4}x^3 - \frac{3}{8}x^4 + \ldots}$$

$$f_{(x)} = \frac{2}{\sqrt{x+1}}$$

$$f_{(x)} = \frac{2}{\sqrt{x+1}} = 2(x+1)^{-\frac{1}{2}} \qquad f_{(0)} = 2$$

$$f'_{(x)} = -(x+1)^{-\frac{3}{2}} \qquad f'_{(0)} = -1$$

$$f''_{(x)} = \frac{3}{2}(x+1)^{-\frac{5}{2}} \qquad f''_{(0)} = \frac{3}{2}$$

$$f'''_{(x)} = -\frac{15}{4}(x+1)^{-\frac{7}{2}} \qquad f'''_{(0)} = -\frac{15}{4}$$

Desarrollamos:

$$f_{(x)} = \sum_{n=o}^{\infty} \frac{f^{(n)}{}_{(0)}}{n!} \cdot x^n$$

$$f_{(x)} = \frac{f^{(0)}{}_{(0)}}{0!} \cdot x^0 + \frac{f'_{(0)}}{1!} \cdot x^1 + \frac{f''_{(0)}}{2!} \cdot x^2 + \frac{f'''_{(0)}}{3!} \cdot x^3 + \ldots$$

$$f_{(x)} = \frac{2}{0!} \cdot x^0 + \frac{-1}{1!} \cdot x^1 + \frac{\frac{3}{2}}{2!} \cdot x^2 + \frac{-\frac{15}{4}}{3!} \cdot x^3 + \ldots$$

$$\boxed{\frac{2}{\sqrt{x+1}} = 2 - 1x + \frac{3}{4}x^2 - \frac{5}{8}x^3 + \ldots}$$