3.4 Calcular Polinomio de Taylor de orden n, en el punto = 0 (desarrollo de Maclaurin) de las siguientes funciones:

i) e^x $\quad f'(x) = e^x \quad \dots \quad f^{(n)}(x) = e^x \quad f^{(n)}(0) = 1$

$$P_{n,0}^{f}(x) = 1 + x + \frac{x^2}{2!} + \dots + \frac{x^k}{k!} + \dots + \frac{x^n}{n!}$$

ii) $(1+x)^{\alpha} \qquad \alpha \in \mathbb{R}$

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

$$f^{(n)}(x) = \frac{\alpha!}{(\alpha-n)!}(1+x)^{\alpha-n} \qquad f^{(n)}(0) = \frac{\alpha!}{(\alpha-n)!}$$

$$P^{f}_{n,0}(x) = 1 + \alpha x + \frac{(\alpha)(\alpha-1)\,x^2}{2} + \dots + \frac{\alpha!}{(\alpha-k)!}\cdot\frac{x^k}{k!} + \dots + \frac{\alpha!}{(\alpha-n)!}\cdot\frac{x^n}{n!}$$