$$f(x) = (3x + 1)^{\pi}$$

$$P_n(x) \simeq f(x)$$

$$P_n(x) \simeq f(0) + \frac{f'(0)}{1!}x + \frac{f''(0)}{2!}x^2 + \frac{f'''(0)}{3!}x^3 + \frac{f''''(0)}{4!}x^4 + \ldots + \frac{f^{(n)}(0)}{n!}x^n$$

$$\begin{aligned} P_n(x) \simeq\ & 1 + 3\pi(3x + 1)^{\pi-1}x + \frac{3\pi(3(\pi-1))(3x+1)^{\pi-2}}{2}x^2 + \frac{3\pi(3(\pi-1))(3(\pi-2))(3x+1)^{\pi-3}}{3!}x^3 \\ & + \frac{3\pi(3(\pi-1))(3(\pi-2))(3(\pi-3))(3x+1)^{\pi-4}}{4!}x^4 + \ldots + \frac{3\pi(3(\pi-1))(3(\pi-2))(3(\pi-3))(\ldots)(3x+1)^{\pi-n}}{n!}x^n \end{aligned}$$

$$\begin{aligned} P_n(x) \simeq\ & 1 + (3(\pi - 0))(1)\,x + \frac{(3(\pi-0))(3(\pi-1))(1)}{2}x^2 + \frac{(3(\pi-0))(3(\pi-1))(3(\pi-2))(1)}{3!}x^3 \\ & + \frac{(3(\pi-0))(3(\pi-1))(3(\pi-2))(3(\pi-3))(1)}{4!}x^4 + \ldots + \frac{(3(\pi-0))(3(\pi-1))(3(\pi-2))(3(\pi-3))(\ldots)(1)}{n!}x^n \end{aligned}$$

$$P_n(x) \simeq \sum_{i=0}^{n} \frac{\prod_{j=1}^{i} 3(\pi-j+1)}{i!}x^i$$