

Unit-2

Answers

$$(2.) y_n = (-1)^n \cdot n! \cdot 2^{n-1} \left[\frac{1}{(2x-1)^{n+1}} + \frac{1}{(2x+3)^{n+1}} \right]$$

$$(3.) y_n = (-1)^n \cdot n! \left[\frac{1}{(1+x)^{n+1}} - \frac{2^n}{(2x+1)^{n+1}} \right]$$

$$(5.) y_n = (-1)^{n-1} (n-1)! \sin^n \theta \sin n\theta, \text{ where } \theta = \tan^{-1}\left(\frac{1}{x}\right)$$

$$(7.) y_n = \frac{(n-1)!}{x}$$

$$(12.) \text{ when } n \text{ is even, } y_n(0) = (-1)^{\frac{n}{2}-1} \cdot 2 \cdot 2^2 \cdot 4^2 \cdot 6^2 \cdots (n-2)^2$$

$n \text{ is odd } y_n(0) = 0$

$$(13.) n \text{ is even, } y_n(0) = 0$$

$n \text{ is odd, } y_n(0) = 1^2 \cdot 3^2 \cdot 5^2 \cdots (n-2)^2$

$$(1.) y_n = \frac{1}{4} \left[4^n \sin\left(4x + \frac{n\pi}{2}\right) + 2^n \sin\left(2x + \frac{n\pi}{2}\right) - 6^n \sin\left(6x + \frac{n\pi}{2}\right) \right]$$