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$$a_0 = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) dx = \frac{1}{\pi} \int_{0}^{\pi} dx = 1$$

$$a_n = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \cos nx dx = \frac{1}{\pi} \int_{0}^{\pi} \cos nx dx = \frac{1}{n\pi} [\sin nx]_{0}^{\pi} = 0$$

$$b_n = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \frac{1}{\sin nx} dx = \frac{1}{\pi} \int_{s}^{\pi} \frac{1}{\sin nx} dx = \frac{1}{n\pi} \left[ -\cos nx \right]_{s}^{\pi} = \frac{1-(4)^n}{n\pi}$$

$$(-1)^n = Cednx$$

$$f \sim \frac{1}{2} + \sum_{n=1}^{\infty} \frac{1-E1^n}{n\pi} \sin nx = \frac{1}{2} + \frac{2}{\pi} (\sin x + \frac{1}{3} \sin 3x + \frac{1}{5} \sin 5x + \dots)$$

$$= \frac{1}{2} + \sum_{n=1}^{\infty} \frac{\sin nx}{n}$$

$$= \frac{1}{2} + \frac{2}{\pi} \sum_{k=0}^{\infty} \frac{\sin(2k+1)x}{2k+1}$$













