1- $f(x) = x^2 - x + 3$, $-2 \le x \le 2$

$$f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} \left[a_n \cos\left(\frac{n\pi x}{L}\right) + b_n \operatorname{sen}\left(\frac{n\pi x}{L}\right) \right] \qquad L = 2$$

$$a_0 = \frac{1}{2}\int_{-2}^{2} (x^2 - x + 3)\,dx = \frac{1}{2}\left(\frac{x^3}{3} - \frac{x^2}{2} + 3x\right)\Big|_{-2}^{2} = \frac{26}{3}$$

$$a_n = \frac{1}{2}\int_{-2}^{2} (x^2 - x + 3)\cos\left(\frac{n\pi x}{2}\right) dx$$

$x^2 - x + 3$	$+$	$\cos\left(\frac{n\pi x}{2}\right)$
$2x - 1$	$+$	$\frac{2}{n\pi}\operatorname{sen}\left(\frac{n\pi x}{2}\right)$
2	$+$	$-\frac{4}{n^2\pi^2}\cos\left(\frac{n\pi x}{2}\right)$
0		$\frac{-8}{n^3\pi^3}\operatorname{sen}\left(\frac{n\pi x}{2}\right)$

$$a_n = \frac{1}{2}(2x-1)\left(\frac{4}{n^2\pi^2}\cos\left(\frac{n\pi x}{2}\right)\right)\Big|_{-2}^{2} = \frac{2}{n^2\pi^2}(2x-1)\left[\cos\left(\frac{n\pi x}{2}\right)\right]_{-2}^{2}$$

$$a_n = \frac{2}{n^2\pi^2}\left[3(\cos(n\pi)) - (-5)\cos(-n\pi)\right]$$

$$a_n = \frac{2}{n^2\pi^2}\left[3(-1)^n + 5(-1)^n\right] = \frac{16(-1)^n}{n^2\pi^2}$$

$$b_n = \frac{1}{2}\int_{-2}^{2} (x^2 - x + 3)\,\text{sen}\left(\frac{n\pi x}{2}\right) dx$$

$x^2 - x + 3$		$\text{sen}\left(\frac{n\pi x}{2}\right)$
$2x - 1$	$+$	$\frac{-2}{n\pi}\cos\left(\frac{n\pi x}{2}\right)$
2	$-$	$\frac{-4}{n^2\pi^2}\text{sen}\left(\frac{n\pi x}{2}\right)$
0	$+$	$\frac{8}{n^3\pi^3}\left(\frac{n\pi x}{2}\right)$

$$b_n = \frac{1}{2}\left[-\frac{2}{n\pi}(x^2 - x + 3)\cos\left(\frac{n\pi x}{2}\right) + \frac{16}{n^3\pi^3}\cos\left(\frac{n\pi x}{2}\right)\right]_{-2}^{2}$$

$$b_n = \frac{1}{2}\left[-\frac{2}{n\pi}(5)\cos(n\pi) + \frac{16}{n^3\pi^3}\cos(n\pi)\right] - \frac{1}{2}\left[\frac{2}{n\pi}\cdot 9\cos(-n\pi) + \frac{16}{n^3\pi^3}\cos(-n\pi)\right]$$

$$b_n = -\frac{5}{n\pi}(-1)^n + \frac{8}{\pi^3 n^3}(-1)^n + \frac{9}{n\pi}(-1)^n - \frac{8}{n^3\pi^3}(-1)^n$$

$$b_n = \frac{4}{n\pi}(-1)^n$$

$$f(x) = \frac{B}{3} + \sum_{n=1}^{\infty}\left[\frac{16(-1)^n}{n^2\pi^2}\cos\left(\frac{n\pi x}{2}\right) + \frac{4(-1)^n}{n\pi}\text{sen}\left(\frac{n\pi x}{2}\right)\right]$$