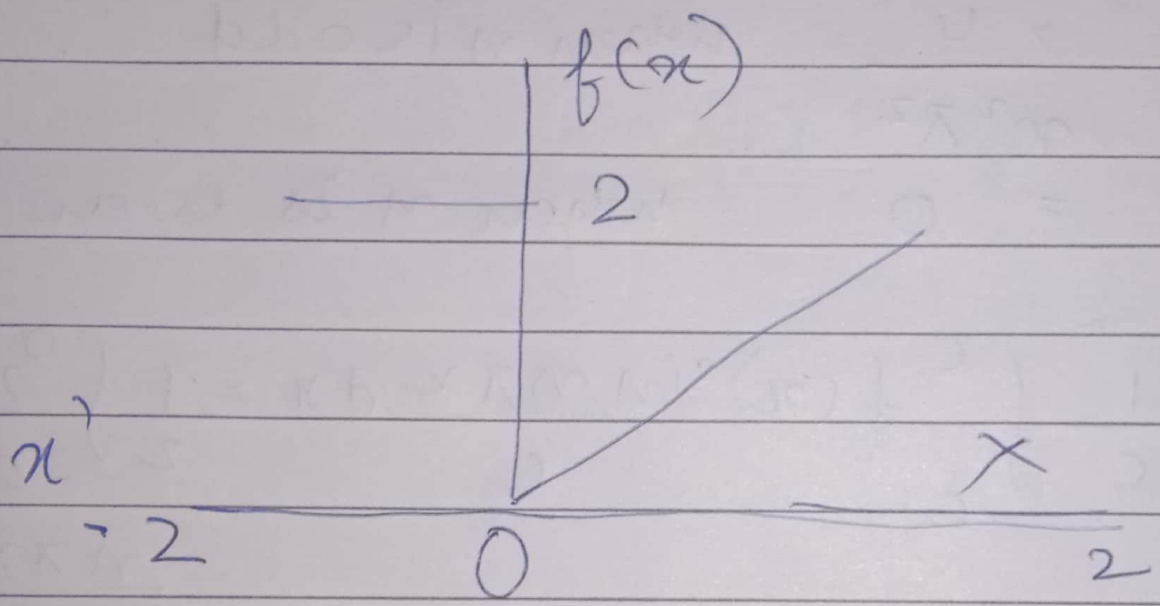
$$f(x) = \begin{cases} 2 \text{ in } -2 \le x \le 0 \\ x \text{ in } 0 < x < 2. \end{cases}$$



Interval is $(-2, 2)$ & $c = 2$.

$$a_0 = \frac{1}{c}\int_{-c}^{c} f(x)\,dx = \frac{1}{2}\left[\int_{-2}^{0} 2\,dx + \int_{-2}^{0} x\,dx\right]$$

$$= \frac{1}{2}\left[[2x]_{-2}^{0} + \left(\frac{x^2}{2}\right)_{0}^{2}\right] = \frac{1}{2}[4+2] = 3$$

$$a_n = \frac{1}{c}\int_{-c}^{c} f(x)\cos\left(\frac{n\pi x}{c}\right)dx = \frac{1}{2}\left[\int_{-2}^{0} 2\cdot\cos\frac{n\pi x}{2}\,dx + \int_{0}^{2} x\cos\frac{n\pi x}{2}\,dx\right]$$

$$= \frac{1}{2}\left[\frac{4}{n\pi}\left(\frac{\sin n\pi x}{2}\right)_{-2}^{0} + \left(\frac{x^2}{n\pi}\sin\frac{n\pi x}{2} + \frac{4}{n^2\pi^2}\cos\frac{n\pi x}{2}\right)_{0}^{2}\right]$$

$$= \frac{1}{2}\left[\frac{4}{n^2\pi^2}\cos n\pi - \frac{4}{n^2\pi^2}\right] = \frac{2}{n^2\pi^2}\left[(-1)^n - 1\right].$$

$= \frac{4}{n^2\pi^2}$ when n is odd

$= 0$ when n is even.

$$b_n = \frac{1}{c}\int_{-c}^{c} f(x)\sin\frac{n\pi x}{c}\,dx = \frac{1}{2}\int_{-2}^{0} 2\sin\frac{n\pi x}{2}\,dx + \frac{1}{2}\int_{0}^{2} x\sin\frac{n\pi x}{2}\,dx$$

$$= \frac{1}{2}\left[2\left(\frac{-2}{n\pi}\cos\frac{n\pi x}{2}\right)\right]_{-2}^{0} + \frac{1}{2}\left[x\left(\frac{-2}{n\pi}\cos\frac{n\pi x}{2}\right) + (1)\frac{4}{n^2\pi^2}\sin\frac{n\pi x}{2}\right]_{0}^{2}$$

$$= \frac{1}{2}\left[\frac{-4}{n\pi} + \frac{4}{n\pi}\cos n\pi\right] + \frac{1}{2}\left[\frac{-4}{n\pi}\cos n\pi + \frac{4}{n^2\pi^2}\sin n\pi\right]$$

$$= \frac{1}{2}\left[-4/n\pi\right] = -2/n\pi$$

$$f(x) = \frac{a_0}{2} + a_1\cos\frac{\pi x}{c} + a_2\cos\frac{2\pi x}{c} + a_3\cos\frac{3\pi x}{c} +$$

$$\ldots$$

$$+ b_1\sin\frac{\pi x}{c} + b_2\sin\frac{2\pi x}{c} +$$

$$b_3\sin\frac{3\pi x}{c} + \ldots$$

$$= \frac{3}{2} - \frac{4}{\pi^2}\left\{\frac{1}{1^2}\cos\frac{\pi x}{2} + \frac{1}{3^2}\cos\frac{3\pi x}{2} + \ldots\right\}$$

$$- \frac{2}{\pi}\left\{\sin\frac{\pi x}{2} + \frac{1}{2}\sin\frac{2\pi x}{2}\right.$$

$$\left. + \frac{1}{3}\sin\frac{3\pi x}{2} + \ldots\right\}$$