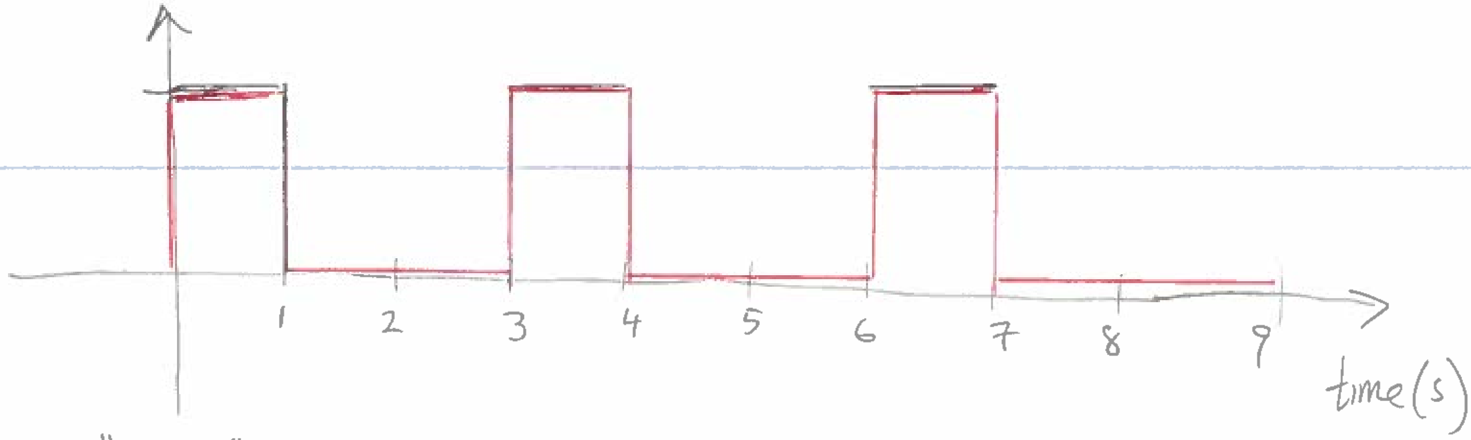

A "skinny" square wave has a period $P = 3\,s$. Only the time from $t=0$ to $t=1$ will contribute to the Fourier components.

A_0 = avg value over one period = $\boxed{\frac{1}{3}}$

$B_0 = 0$ (always)

$$A_1 = \frac{2}{P}\int_0^P f(t)\cos\left(\frac{2\pi\cdot 1}{P}t\right)dt = \frac{2}{3}\int_0^1 \cos\left(\frac{2\pi}{3}t\right)dt$$

$$= \frac{2}{3}\left(\frac{3}{2\pi}\right)\left[\sin\left(\frac{2\pi}{3}\right) - \sin(0)\right] = \boxed{\frac{1}{\pi}\left[\sin\frac{2\pi}{3}\right]}$$

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$$= \frac{2}{3}\left(\frac{3}{2\pi}\right)\left[-\cos\left(\frac{2\pi}{3}\right) - (-\cos(0))\right] = \boxed{\frac{1}{\pi}\left[1-\cos\left(\frac{2\pi}{3}\right)\right]}$$

$$A_2 = \frac{2}{P}\int_0^P f(t)\cos\left(\frac{2\pi\cdot 2}{P}t\right)dt = \frac{2}{3}\int_0^1 \cos\left(\frac{4\pi}{3}t\right)dt$$

$$= \frac{2}{3}\left(\frac{3}{4\pi}\right)\left[\sin\left(\frac{4\pi}{3}t\right|_0^1 = \boxed{\frac{1}{2\pi}\left[\sin\left(\frac{4\pi}{3}\right)\right]}$$

$$B_2 = \frac{2}{P}\int_0^P f(t)\sin\left(\frac{2\pi\cdot 2}{P}t\right)dt = \frac{2}{3}\int_0^1 \sin\left(\frac{4\pi}{3}t\right)dt$$

$$= \frac{2}{3}\left(\frac{3}{4\pi}\right)\left[-\cos\frac{4\pi}{3} - (-\cos(0)\right] = \boxed{\frac{1}{2\pi}\left(1-\cos\left(\frac{4\pi}{3}\right)\right)}$$

$$A_3 = \frac{2}{P}\int_0^P f(t)\cos\left(\frac{2\pi\cdot 3}{P}t\right)dt = \frac{2}{3}\int_0^1 \cos(2\pi t)\,dt$$

$$= \frac{2}{3}\left(\frac{1}{2\pi}\right)\left[\sin(2\pi) - \sin(0)\right] = \boxed{0}$$

$$B_3 = \frac{2}{P}\int_0^P f(t)\sin\left(\frac{2\pi\cdot 3}{P}t\right)dt = \frac{2}{3}\int_0^1 \sin(2\pi t)\,dt$$

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$$A_4 = \frac{2}{P}\int_0^P f(t)\cos\left(\frac{2\pi\cdot 4}{P}t\right)dt = \frac{2}{3}\int_0^1 \cos\left(\frac{8\pi}{3}t\right)dt$$

$$= \frac{2}{3}\left(\frac{3}{8\pi}\right)\left[\sin\left(\frac{8\pi}{3}\right) - \sin(0)\right] = \boxed{\frac{1}{4\pi}\sin\left(\frac{8\pi}{3}\right)}$$

$$B_4 = \frac{2}{P}\int_0^P f(t)\sin\left(\frac{2\pi\cdot 4}{P}t\right)dt = \frac{2}{3}\int_0^1 \sin\left(\frac{8\pi}{3}t\right)dt$$

$$= \frac{2}{3}\left(\frac{3}{8\pi}\right)\left[-\cos\left(\frac{8\pi}{3}\right) - (-\cos(0))\right] = \boxed{\frac{1}{4\pi}\left(1 - \cos\left(\frac{8\pi}{3}\right)\right)}$$

In general

$$A_n = \begin{cases} \frac{1}{n\pi}\sin\left(\frac{2\pi n}{3}\right) & n \text{ not divis by } 3 \\ 0 & n \text{ divis by } 3 \end{cases}$$

$$B_n = \begin{cases} \frac{1}{n\pi}\left[1 - \cos\left(\frac{2\pi n}{3}\right)\right] & n \text{ not divis by } 3 \\ 0 & n \text{ divis by } 3 \end{cases}$$