Very simply put (literal & figurative). This instance will absolutely hit orthogonality. Prime of a function, of a date at such a date, and such a time, at a time. I understand when that will happen! Nevertheless, in the humblest Christian manner, considering the late French mathematician Mr. Fourier, and given this simple, implementation, it is understood that;

$$a_0 = \langle f, \mathbf{w}_0 \rangle \frac{2}{\sqrt{2\pi}} = \frac{2}{\sqrt{2\pi}} \int_0^{2\pi} f(x) \frac{1}{\sqrt{2\pi}} dx = \frac{1}{\pi} \int_0^{2\pi} f(x)\, dx$$

$$a_1 = \langle f, \mathbf{w}_1 \rangle \frac{1}{\sqrt{\pi}} = \frac{1}{\sqrt{\pi}} \int_0^{2\pi} f(x) \frac{1}{\sqrt{\pi}} \cos x\, dx = \frac{1}{\pi} \int_0^{2\pi} f(x) \cos x\, dx$$

$$\vdots$$

$$a_n = \langle f, \mathbf{w}_n \rangle \frac{1}{\sqrt{\pi}} = \frac{1}{\sqrt{\pi}} \int_0^{2\pi} f(x) \frac{1}{\sqrt{\pi}} \cos nx\, dx = \frac{1}{\pi} \int_0^{2\pi} f(x) \cos nx\, dx$$

$$b_1 = \langle f, \mathbf{w}_{n+1} \rangle \frac{1}{\sqrt{\pi}} = \frac{1}{\sqrt{\pi}} \int_0^{2\pi} f(x) \frac{1}{\sqrt{\pi}} \sin x\, dx = \frac{1}{\pi} \int_0^{2\pi} f(x) \sin x\, dx$$

$$\vdots$$

$$b_n = \langle f, \mathbf{w}_{2n} \rangle \frac{1}{\sqrt{\pi}} = \frac{1}{\sqrt{\pi}} \int_0^{2\pi} f(x) \frac{1}{\sqrt{\pi}} \sin nx\, dx = \frac{1}{\pi} \int_0^{2\pi} f(x) \sin nx\, dx$$

The function $g(x)$ is the ***n*th-order Fourier approximation** of f on the interval $[0, 2\pi]$. Like Fourier coefficients, this function is named after the French mathematician Jean-Baptiste Joseph Fourier. This brings you to Theorem 5.20.

Thank GOD for the Holy Spirit! They are saying one thing, I am saying another, somebody is right, and somebody is wrong! But given that the Lord does not make any mistakes, but people do, proving inside of time, we shall see!

#GodBless