$$E = \{f : [0,1] \mapsto \mathbb{R} \text{ contínua}\}$$

$$f(t) = t^2 - t + 1$$

$$u(t) = 1 \qquad w(t) = t$$

Calcula a projeção ortogonal de f(t) sobre o plano gerado por u(t) e w(t).

$$\langle f, u\rangle = \int_0^1 f(t)u(t)dt = \int_0^1 t^2 - t + 1dt = \left[\frac{1}{3}t^3 - \frac{1}{2}t^2 + t\right]_0^1 = \frac{5}{6}$$

$$\langle u, u\rangle = \int_0^1 u(t)u(t)dt = [t]_0^1 = 1$$

$$\langle f, w\rangle = \int_0^1 f(t)w(t)dt = \int_0^1 t^3 - t^2 + tdt = \left[\frac{1}{4}t^4 - \frac{1}{3}t^3 + \frac{1}{2}t^2\right]_0^1 = \frac{5}{12}$$

$$\langle w, w\rangle = \int_0^1 w(t)w(t)dt = \int_0^1 t^2dt = \left[\frac{1}{3}t^3\right]_0^1 = \frac{1}{3}$$

$$\frac{\langle f(t), u(t)\rangle}{\langle u(t), u(t)\rangle}u(t) = \frac{5}{6}$$

$$\frac{\langle f(t), w(t)\rangle}{\langle w(t), w(t)\rangle}w(t) = \frac{5t}{4}$$

Projeção ortogonal de f(t) sobre o plano gerado de u(t)=1 e w(t)=t é:

$$\frac{5}{6} + \frac{5t}{4}$$