$$E = \{f : [0,1] \mapsto \mathbb{R} \text{ contínua}\}$$
$$\langle f, g \rangle = \int_0^1 f(t)g(t)dt$$
$$f(t) = t^2 - t + 1$$
$$u(t) = 1 \qquad w(t) = t$$

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

$$Usando Gram - Schmidt :$$
$$v_1 := u$$
$$v_2 := w - proj_{v_1} w = \frac{\int_0^1 t\mathrm{dt}}{\int_0^1 1\mathrm{dt}} u = t - \frac{1}{2}$$
$$||v_2|| = \sqrt{\langle v_2, v_2 \rangle} = \sqrt{\int_0^1 (t^2 + \frac{1}{4})\,\mathrm{d}t} = \sqrt{\frac{1}{3}t^3 + \frac{1}{4}t}$$
$$\frac{v_2}{||v_2||} = \frac{t - \frac{1}{2}}{\sqrt{\frac{1}{3}t^3 + \frac{1}{4}t}}$$
$$b_1 := 1 \qquad b_2 := \frac{t - \frac{1}{2}}{\sqrt{\frac{1}{3}t^3 + \frac{1}{4}t}}$$
$$proj_{b_1} f + proj_{b_1} f = \langle f, b_1 \rangle b_1 + \langle f, b_2 \rangle b_2$$
$$= (\int_0^1 (t^2 - t + 1)\,\mathrm{dt} \cdot 1 + (\int_0^1 (t^2 - t + 1 \frac{t - \frac{1}{2}}{\sqrt{\frac{1}{3}t^3 + \frac{1}{4}t}}\,\mathrm{dt}) \cdot (t^2 - t + 1)$$
$$= \frac{5}{6} - \frac{137}{200}(t^2 - t + 1)$$