6/a

$$P_4 = x^4 + \underbrace{\frac{1}{0.33}\frac{1}{42}\left(x^2 - \frac{1}{3}\right)}_{\frac{1}{16}x^2 - \frac{1}{48}} - \frac{\langle x^4, P_0\rangle}{\|P_0\|^2} P_0$$

$$\langle x^4, P_0\rangle = \int_{-1}^{1} x^4 \cdot 1\,dx = 2\int_{0}^{1} x^4\,dx = 2\cdot\frac{1}{5} = \frac{2}{5}$$

$$\|P_0\|^2 = \langle 1, 1\rangle = \int_{-1}^{1} 1\cdot 1\,dx = 2$$

$$P_4 = x^4 + \frac{1}{16}x^2 - \frac{1}{48} - \frac{2/5}{2}\cdot 1$$

$$\boxed{P_4 = x^4 + \frac{1}{16}x^2 - 0.22}$$