$P_0 = 1$ $\qquad V_0 = 1,\ V_1 = x,\ V_2 = x^2$

$$P_1 = 1 - \frac{\langle x, 1\rangle}{\langle 1,1\rangle}\cdot 1 = x - 0\cdot 1 = x$$

$$P_2 = x^2 - \frac{\langle x^2, 1\rangle}{\langle 1,1\rangle}\cdot 1 - \frac{\langle x^2, x\rangle}{\langle x, x\rangle}\cdot x = \text{[illegible]}$$

$$= x^2 - \frac{2\cdot(16+9+4+1)}{8} - \frac{0}{60}\cdot x = x^2 - \frac{60}{8} = x^2 - \frac{15}{2}$$

$$W_2^*(x) = \sum_{k=0}^{2} a_k \cdot P_k(x)$$

$$a_k = \frac{\langle W, P_k\rangle}{\langle P_k, P_k\rangle}$$

$$a_0 = \frac{\langle W, P_0\rangle}{\langle P_0, P_0\rangle} = 0$$

$$a_1 = \frac{\langle W, P_1\rangle}{\langle P_1, P_1\rangle} = \frac{2\cdot\left((-5,5)\cdot(-4) + (-3)\cdot(-5) + (-2)\cdot(-3,2) + (-1)\cdot(-1)\right)}{60} =$$

$$= \frac{22 + 15 + 6,4 + 1}{30} = \frac{37 + 7,4}{30} = \frac{44,4}{30} = \frac{37}{25}$$

$$a_2 = \frac{\langle W, P_2\rangle}{\langle P_2, P_2\rangle} = 0$$

$$W_2^*(x) = 0\cdot 1 + \frac{37}{25}\cdot x + 0\cdot\left(x^2 - \frac{15}{2}\right) = \frac{37}{25}x$$