10. $u_1 = [1]$, $u_2 = [2]$, $u_3 = [3]$, $v_1 = [3]$, $v_2 = [4]$, $v_3 = [1]$

$$g([x]) = [3]\frac{(x-[2])(x-[3])}{([1]-[2])([1]-[3])} + [4]\frac{(x-[1])(x-[3])}{([2]-[1])([2]-[3])} + [1]\frac{(x-[1])(x-[2])}{([3]-[1])([3]-[2])} \rightarrow$$

$$[3]\frac{x^2+[0]x+[1]}{([1]-[2])([1]-[3])} + [4]\frac{x^2+[1]x+[3]}{([2]-[1])([2]-[3])} + [1]\frac{x^2+[2]x+[2]}{([3]-[1])([3]-[2])} \rightarrow$$

$$[3]\frac{x^2+[0]x+[1]}{([4])(3)} + [4]\frac{x^2+[1]x+[3]}{([1])([4])} + [1]\frac{x^2+[2]x+[2]}{([2])([1])} \rightarrow$$

$$[3]\frac{x^2+[0]x+[1]}{[2]} + [4]\frac{x^2+[1]x+[3]}{[4]} + [1]\frac{x^2+[2]x+[2]}{[2]} \rightarrow$$

$$[3][3](x^2 + [0]x + [1]) + [4][4](x^2 + [1]x + [3]) + [1][3](x^2 + [2]x + [2]) \rightarrow$$

$$[4](x^2 + [0]x + [1]) + [1](x^2 + [1]x + [3]) + [3](x^2 + [2]x + [2]) \rightarrow$$

$$[4]x^2 + [0]x + [4] + [1]x^2 + [1]x + [3] + [3]x^2 + [1]x + [1] \rightarrow$$

$$[3]x^2 + [2]x + [3] = g([x])$$