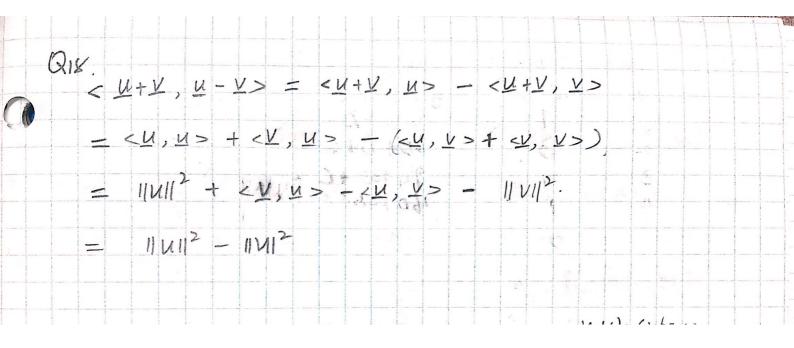
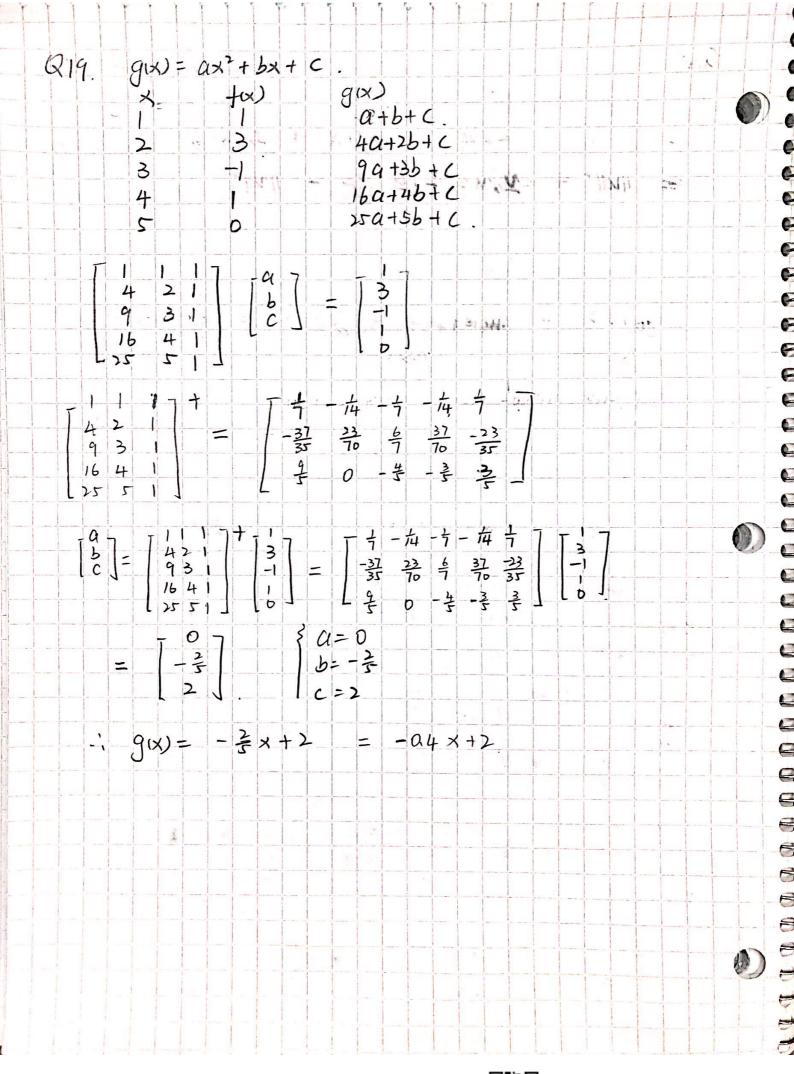


Q17 we assume that B= [w1, w2, ..., wn] is an orthogonal busis of w. then projn (x) = c, wi + c, wi + co win where $C_i = \frac{\langle \underline{\lambda}, \underline{h}_i \rangle}{\langle \underline{h}_i, \underline{h}_i \rangle}$ $i = 1, 2, \dots, n$. D. F 1× + 1) = Projn (x+1) = C1 m + (1 m + -+ Cn m Ci = 2x+1, bi> $F(X) = proj_n(X) = \alpha_1 \frac{m_1}{m_1} + \alpha_2 \frac{m_2}{m_2} + \cdots + \alpha_n \frac{m_n}{m_n} = \alpha_1 \frac{m_1}{m_1} = \alpha_1 \frac{m_1}{m_1} = \alpha_1 \frac{m_1}{m_2} = \alpha_1 \frac{m_1}{m_1} = \alpha_1 \frac{m_2}{m_2} = \alpha_1 \frac{m_1}{m_2} = \alpha_1 \frac{m_2}{m_1} = \alpha_1 \frac{m_2}{m_2} = \alpha_2 \frac$ $F(Y) = proj_n(Y) = b_1 \underline{w_1} + b_2 \underline{w_2} + \cdots + b_n \underline{w_n} \qquad b_1 = \frac{c_1}{c_2}, \underline{m_2}$ $\langle \underline{m}, \underline{m} \rangle = \langle \underline{m}, \underline{m} \rangle + \langle \underline{m}, \underline{m} \rangle$ Ci = ai + bi |i= 1,2, ..., n. So. F1x+1)= projn (x+1)= C, m+ C, w+ + + + Cn mn = (a,+b,) w, + (a,+b,) w, + ... + (an+bn) wn = (a, w + a, m + ... + an mn) + (b, m + b, m + ... + bn mn) Proju(x) + projuly) = F(x) + F(y) -> true D. F(cx) = projn(cx) = u, m+ u, m++ un mn u; = <ix, m> $F(X) = proj_N(X) = a_1 + a_2 + + a_1 + a_2 + + a_2 + a_3 + a_3 = a_3 = a_3 + a_2 + a_3 + a_4 + a_4 + a_5 +$ $\frac{\langle cz, w'\rangle}{\langle m', m'\rangle} = \frac{\langle c \not\in z, m'\rangle}{\langle m', w'\rangle}$ J. Ui = c. ai So. F((2) = projn((x) = u1 m + u2 m2 + ... + un mn = ca, w1 + ca, w2 + . + can wn = C (a, w + a, m + ... + an wn) = c · proj (×) = c F(×) So, F is a linear transformation





Q20. (a), $\angle U$, $Y > = U^{T}Y = 0$ < PU, $PY > = < P^{T}PY$, Y > = < IY, Y > = < Y, $Y > = U^{T}Y = 0$. So, Pu and Py are also orthogonal to each other b) <x, x = 11 ×112. $\langle PZ, PZ \rangle = \langle P^7PZ, Z \rangle = \langle IZ, Z \rangle = \langle Z, Z \rangle = |Z||^2$ = 11P×112 ·, 11×11 = 11 P×11