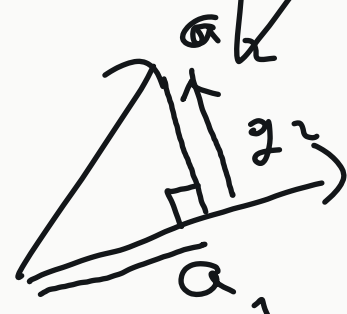


$$A = \begin{bmatrix} 6 & 3 \\ 8 & 4 \\ 0 & 3 \end{bmatrix}$$

$$g_1 = \begin{bmatrix} 6 \\ 8 \\ 0 \end{bmatrix}$$

$$r_{11} = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$$

$$g_1 = \frac{g_1}{r_{11}} = \begin{bmatrix} 3/5 \\ 4/5 \\ 0 \end{bmatrix}$$



$$\text{pr}_{a_1} a_2 = g_1 \cdot \underbrace{\langle a_2, g_1 \rangle}_{r_{12}}$$

$$g_2 = \begin{bmatrix} 3 \\ 4 \\ 3 \end{bmatrix} - \underbrace{\begin{bmatrix} 3 \\ 4 \\ 0 \end{bmatrix}}_{g_1} \cdot \frac{1}{5} \cdot 5 = \begin{bmatrix} 0 \\ 0 \\ 3 \end{bmatrix}$$

$$r_{12} = \left\langle \begin{bmatrix} 3 \\ 4 \\ 3 \end{bmatrix}, \begin{bmatrix} 3 \\ 4 \\ 0 \end{bmatrix} \right\rangle \frac{1}{5} = (3^2 + 4^2) \frac{1}{5} = 5$$

$$\textcircled{b} \quad Ax = b \iff A^T A x = A^T b$$

$$QRx = b$$

$$Rx = Q^T b$$

$$\begin{bmatrix} 10 & 5 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 3/5 & 4/5 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 0 \\ 25 \\ 6 \end{bmatrix}$$

$$- || - = \begin{bmatrix} 20 \\ 6 \end{bmatrix}$$

$$\boxed{x_2 = 2}$$

$$10x_1 = 20 - 5x_2 = 10 \Rightarrow \boxed{x_1 = 1}$$