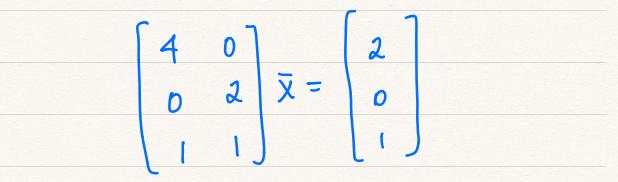
1. In
$$\mathbb{R}^3$$
 with the usual scalar product, consider
the subspace U
 $U = \begin{cases} x \\ y \\ z \end{cases}$
 $x - y + 3z = 0$

Compute a basis for U¹.

2. In a euclidean vector space of dimension 3, the scalar product has Gram matrix $\begin{pmatrix}
1 & 1 & 1 \\
1 & 2 & 2 \\
1 & 2 & 3
\end{pmatrix}$

with respect to a determined basis B. Let U be the subspace $u = \int [\bar{x}]_{B} = \begin{pmatrix} x \\ y \\ z \end{pmatrix} : x-y=6 \int Compute U^{\perp}.$ 3. Let R³ be equiped with the usual scalar product. Let E be the standard basis and let B be the orthonormal basis obtained by applying Gram-Schmidt to E. Find P. B4E

4. Consider the following equation



and observe that it does not have a solution. Find the best approximation to a solution.

Hint: Compute the orthogonal projection of \overline{b} onto ColA, where $A\overline{x}=\overline{b}$.

5. Find an orthogonal basis that diagonalizes the map $T(\bar{x}) = A\bar{x}$ where

A= (222 01-1 002	
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