# ASSIGNMENT-2

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## Vector Arithmetic(Rank)

**Question:**(1.6.4) Show that the vectors $2\hat{i} - 3\hat{j} + 4\hat{k}$ and $-4\hat{i} + 6\hat{j} - 8\hat{k}$ are collinear.

**Solution:** We have the vectors $a = \begin{pmatrix} 2 \\ -3 \\ 4 \end{pmatrix}$ and $b = \begin{pmatrix} -4 \\ 6 \\ -8 \end{pmatrix}$

The matrix $A = \begin{pmatrix} a & b \end{pmatrix}^T$

$$A = \begin{pmatrix} 2 & -3 & 4 \\ -4 & 6 & -8 \end{pmatrix}$$

$$\xleftrightarrow{R_2 = R_2 + 2R_1} \begin{pmatrix} 2 & -3 & 4 \\ 0 & 0 & 0 \end{pmatrix}$$

which has rank 1. Hence, we conclude the given vectors are collinear