1		^	
Linear	Trans	mom	cotion !
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(i):
$$T(\vec{a}+\vec{b}) = T(\vec{a}) + T(\vec{b})$$

(ii) $T(c\vec{a}) = cT(\vec{a})$.

$$\langle Q \rangle$$
: If $T: \mathbb{R}^2 \to \mathbb{R}^2$ is defined by $T(\alpha_1, \alpha_2) = (\alpha_1 + \alpha_2, 3\alpha_1)$. Show that T is linear transformation. Solp:

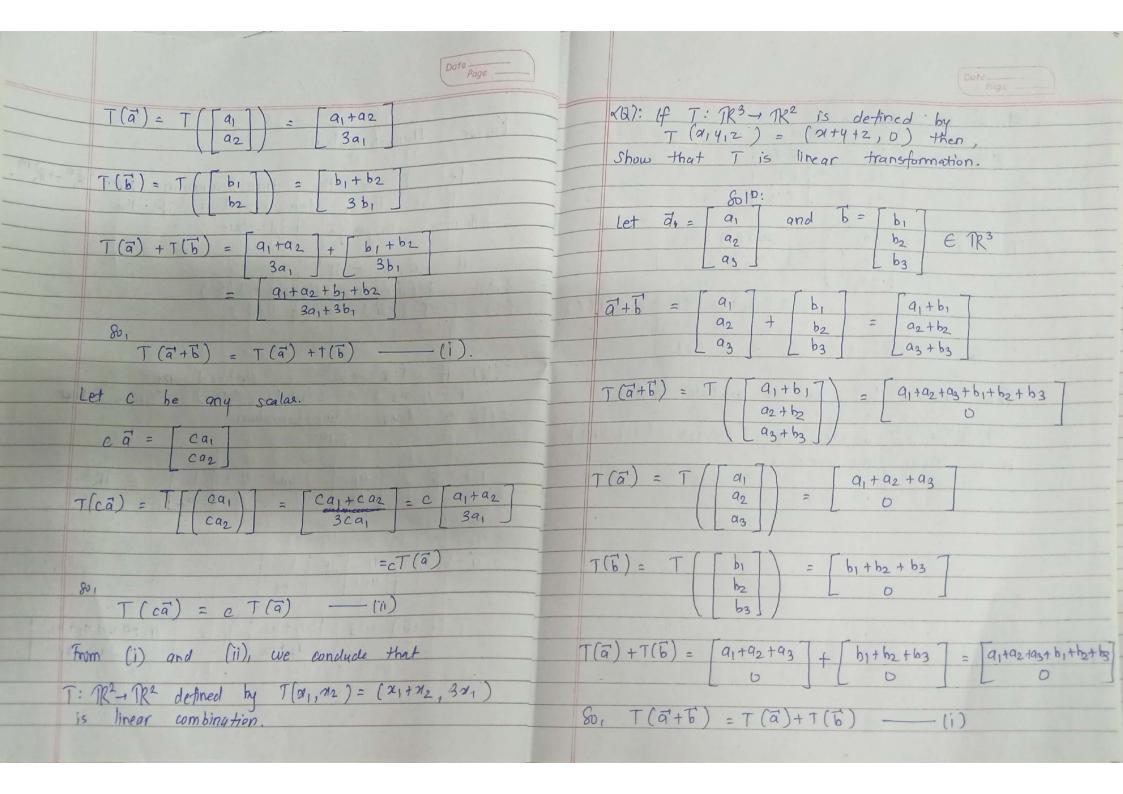
Let
$$\vec{a}' = \begin{bmatrix} a_1 \\ a_2 \end{bmatrix}$$
 and $\vec{b} = \begin{bmatrix} b_1 \\ b_2 \end{bmatrix} \in \mathbb{R}^2$.

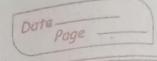
Now

$$\vec{a} + \vec{b} = \begin{bmatrix} a_1 \\ a_2 \end{bmatrix} + \begin{bmatrix} b_1 \\ b_2 \end{bmatrix}$$

$$T(\vec{a}+\vec{b}) = T(\vec{a}_1+b_1) = q_1+a_2+b_1+b_2$$

 $q_1+a_2+b_1+b_2$
 $q_1+a_2+b_1+b_2$
 $q_1+a_2+b_1+b_2$





Let \vec{c}' be any scalar $\vec{c} \vec{o} = \vec{c} \quad \vec{a}_1 \quad \vec{c} \quad \vec{a}_1 \quad \vec{c} \quad \vec{a}_2 \quad \vec{c} \quad \vec{a}_2 \quad \vec{c} \quad \vec{a}_3 \quad \vec{c} \quad \vec{a}_3 \quad \vec{c} \quad \vec{a}_3 \quad \vec{c} \quad \vec{a}_3 \quad \vec{c} \quad \vec{c} \quad \vec{a}_1 \quad \vec{c} \quad$

 $T(c\vec{a}) = T(ca_1) = [ca_1 + ca_2 + ca_3]$ $[ca_2] = [ca_1 + ca_2 + ca_3]$ $[ca_3]$ $[ca_1 + ca_2 + ca_3] = CT(\vec{a})$

 $801 T(c\vec{a}) = cT(\vec{a}) - (ii)$

From (i) and (ii), we can conclude that.

T: TR3 - TR2 defined by T (M,4,2) = (M+4+2,0)
is a linear transformation.