

$$a_{11}^2+a_{21}a_{22}+a_{31}a_{33} = 0, \; a_{11}a_{12}+a_{22}^2+a_{32}a_{33} = 0, \; a_{11}a_{13}+a_{22}a_{23}+a_{33}^2 = 0, \; a_{21}a_{22}a_{11}^2+a_{31}a_{33}a_{11}^2-a_{13}a_{31}^2a_{11}-a_{11}a_{12}a_{21}^2+a_{21}a_{22}a_{31}a_{33}-a_{21}a_{23}a_{31}a_{32} = 0, \; a_{21}a_{22}a_{12}^2+a_{22}a_{23}a_{32} = 0,$$