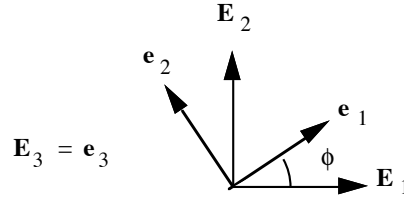


The bases \mathbf{e}_i and \mathbf{E}_A are related as follows:



For each of the following cases find \mathbf{F} , \mathbf{U} , \mathbf{V} and \mathbf{R} . Be sure to show explicitly what basis you are using for each tensor. The parameters ϕ , α , β and γ are constants with $\alpha \neq 1$, $\beta \neq 1$ and $\gamma \neq 0$.

Case 1. The deformation is defined by

$$\phi = 0 \quad \text{and} \quad x_1 = \alpha X_1 \quad x_2 = \beta X_2 \quad x_3 = X_3 \quad (1)$$

Case 2. The deformation is defined by

$$\phi \neq 0 \quad \text{and} \quad x_1 = \alpha X_1 \quad x_2 = \beta X_2 \quad x_3 = X_3 \quad (2)$$

Case 3. The deformation is defined by

$$\phi = 0 \quad \text{and} \quad x_1 = \alpha X_1 + \gamma X_2 \quad x_2 = \beta X_2 \quad x_3 = X_3 \quad (3)$$

Choose specific values for α , β and γ to simplify the expressions for eigenvalues and eigenvectors with the restriction that all eigenvalues must be positive.

Case 4. The deformation is defined by

$$\phi \neq 0 \quad \text{and} \quad x_1 = \alpha X_1 + \gamma X_2 \quad x_2 = \beta X_2 \quad x_3 = X_3 \quad (4)$$

Use the same values of α , β and γ as used for Case 3.