

# Download File PDF Solution Manual Continuum Mechanics Mase 2nd Edition

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so many fake sites. this is the first one which worked! Many thanks

$$\begin{aligned} -n_1 + 2n_2 &= 0 \\ 2n_1 - 4n_2 &= 0 \\ -3n_2 &= 0 \end{aligned}$$

so that  $n_1 = 2n_2$  and since  $n_3 = 0$ , we have  $(2n_2)^2 + n_2^2 = 1$ , or  $n_2 = \pm 1/\sqrt{5}$ , and  $n_1 = \pm 2/\sqrt{5}$ . For  $\lambda_{(1)} = 1$ , Eq 2.6-5 yields

$$\begin{aligned} 4n_1 + 2n_2 &= 0 \\ 2n_1 + n_2 &= 0 \end{aligned}$$

together with  $2n_1 = 0$ . Again  $n_3 = 0$ , and here  $n_1^2 + (-2n_1)^2 = 1$  so that  $n_1 = \pm 1/\sqrt{5}$  and  $n_2 = \pm 2/\sqrt{5}$ . From these results the transformation matrix  $\mathcal{A}$  is given by

$$[\mathcal{A}] = \begin{bmatrix} 0 & 0 & \pm 1 \\ 2/\sqrt{5} & \pm 1/\sqrt{5} & 0 \\ \pm 1/\sqrt{5} & \pm 2/\sqrt{5} & 0 \end{bmatrix}$$

which identifies two sets of principal direction axes, one a reflection of the other with respect to the origin. Also, it may be easily verified that  $\mathcal{A}$  is orthogonal by multiplying it with its transpose  $\mathcal{A}^T$  to obtain the identity matrix. Finally, from Eq 2.6-12 we see that using the upper set of the  $\pm$  signs,

$$\begin{bmatrix} 0 & 0 & 1 \\ 2/\sqrt{5} & 1/\sqrt{5} & 0 \\ -1/\sqrt{5} & 2/\sqrt{5} & 0 \end{bmatrix} \begin{bmatrix} 5 & 2 & 0 \\ 2 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix} \begin{bmatrix} 2/\sqrt{5} & -1/\sqrt{5} \\ 1/\sqrt{5} & 2/\sqrt{5} \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

**Example 2.6-2**  
Show that the principal values for the tensor having the matrix

$$[\mathcal{T}] = \begin{bmatrix} 5 & 1 & \sqrt{2} \\ 1 & 5 & \sqrt{2} \\ \sqrt{2} & \sqrt{2} & 6 \end{bmatrix}$$

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