1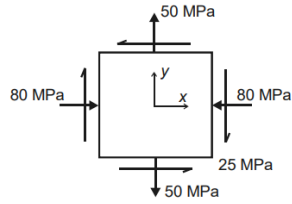. The state of plane stress at a point is represented by the stress element below. Determine the stresses acting on an element oriented 45^0 clockwise with respect to the original element.

2.

The state of stress at a point is given in the matrix form

$$[\sigma_{ij}] = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 2 & -2 \\ 3 & -2 & 1 \end{bmatrix}$$

Determine
(a) the traction vector acting on a plane through the point whose unit normal is
   $\hat{n} = (1/3)\hat{e}_1 + (2/3)\hat{e}_2 - (2/3)\hat{e}_3$
(b) the component of this traction acting perpendicular to the plane
(c) the shear component of traction.