Principal stresses

The stress state for a material point is given in a Cartesian basis $(\underline{e}_1, \underline{e}_2, \underline{e}_3)$ by:

$$[\underline{\underline{\sigma}}] = \begin{bmatrix} 2 & 10 & 0 \\ 10 & 0 & 8 \\ 0 & 8 & 0 \end{bmatrix} \tag{1}$$

Calculate the principal stresses and the principal directions for this stress tensor.