Stretch

Given the following right Cauchy-Green deformation tensor C

$$[C] = \begin{bmatrix} 9 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 0.36 \end{bmatrix} \tag{1}$$

(a) Find the stretch for the material elements that were in the direction of $\underline{e}_1$, $\underline{e}_2$ and $\underline{e}_3$.

(b) Find the stretch for the material element that was in the direction of $\underline{e}_1 + \underline{e}_2$.

(c) Find $\cos\theta$, where θ is the angle between $d\underline{x}^{(1)}$ and $d\underline{x}^{(2)}$ and where $d\underline{X}^{(1)} = dS_1\underline{e}_1$ and $d\underline{X}^{(2)} = dS_2\underline{e}_1$ deform into $d\underline{x}^{(1)} = ds_1\underline{m}$ and $d\underline{x}^{(2)} = ds_2\underline{u}$.