

1.1.2

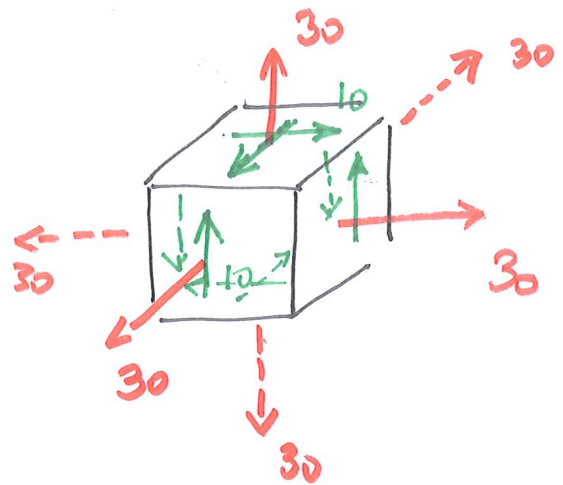
GIVET:

$$\underline{n} = \frac{1}{\sqrt{5}} \begin{bmatrix} 1 \\ 2 \\ 0 \end{bmatrix}$$

$$\underline{\underline{S}} = \begin{bmatrix} 30 & 0 & 10 \\ 0 & 30 & 10 \\ 10 & 10 & 30 \end{bmatrix} \text{ [MPa]}$$

SÖKT: Bestäm normalspänningen på ytan med normalen \underline{n} .

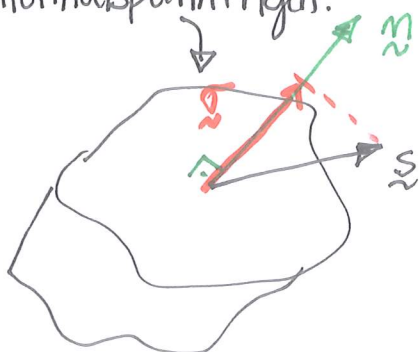
Spänningstillståndet:



1). Ta fram. spänningsvektorn, \underline{s} :

$$\underline{s} = \underline{\underline{S}} \cdot \underline{n} = \begin{bmatrix} 30 & 0 & 10 \\ 0 & 30 & 10 \\ 10 & 10 & 30 \end{bmatrix} \begin{bmatrix} 1/\sqrt{5} \\ 2/\sqrt{5} \\ 0 \end{bmatrix} = \frac{1}{\sqrt{5}} \begin{bmatrix} 30 \\ 60 \\ 30 \end{bmatrix} \text{ [MPa]}$$

normalspänningen.



2) Projera spänningsvektorn på normalen.

$$\sigma_n = \underline{n}^T \underline{s} = \frac{1}{\sqrt{5}} [1 \ 2 \ 0] \begin{bmatrix} 30/\sqrt{5} \\ 60/\sqrt{5} \\ 30/\sqrt{5} \end{bmatrix}$$

$$\underline{\underline{\sigma}} = 30 \text{ MPa}$$