## Further note on Problem 1, Problem Set 1

Consider the following ordinary differential equation (ODE)

$$
\mathrm{x}(\mathrm{t})+\mathrm{a} \mathrm{x}^{\prime}(\mathrm{t})=\mathrm{c} \text { where } \mathrm{a} \text { and } \mathrm{c} \text { are constants. }
$$

The solution has the form:

$$
x(t)=c-b \exp (-t / a)
$$

To check, write out $\mathrm{x}^{\prime}(\mathrm{t})$ and substitute it to the ODE.
The value of $b$ can be determined by the boundary condition
in this case $\mathrm{x}(\mathrm{t}=0)=0$ is applicable and implies $\mathrm{b}=\mathrm{c}$
It is helpful to draw out sigma(t) in a).
For 1d) consider the stress, the elastic strain, and the elastic strain energy immediately before and after failure. You may want to review Section 2.9 of Charlie Raymond's notes.

