V.14

a) Sketch de stress-strain relation for a linear, elastic material, and
b) add possible non-linear material behavior (with explanation/motivation).
c) Explain what happens for unloading of c1) a linear, elastic material, of c2) a elastic-plastic material (for small AND for large strains).
d) Sketch the relation of shear-stress versus strain- or deformation-rate, for d1) a lineair, d2) a shear-thickening, d3) a shear-thinning, or d4) a yield-stress-fluid.

V.15

Given is a wire (length L=0.1m, cross-section HW, volume $V=LHW$) for a homogeneous, elastic, isotropic, rubber-like material. What is the work necessary to quickly (or very slowly) stretch the wirefrom stress 0 to length $3L$. Which strain-rate is needed for making the elastic and the viscous contribution equaly important?

Material-properties:
Kevin-Voigt viscoelastic solid (http://en.wikipedia.org/wiki/Viscoelasticity):

    relation for stress = function of strain and strain-rate:
    $\sigma = E\varepsilon + \eta\dot{\varepsilon}$ with modulus of Young E=0.02 MPa and viscosity η = 10 Pa s.