Prob. 4.2 - bolt

> `restart;`

> `Digits:=4:`

Diameter, initial force, area

> `d:=.008:F[0]:=1000:A:=Pi*d^2/4:`

Initial stress

> `sigma[0]:=evalf(F[0]/A);`

$$\sigma_0 := .1989 \; 10^8$$

Modulus: function of time (Pa)

> `EE:= t -> 5*exp(-t^(1/3))*10^9:`

Strain (remains constant)

> `epsilon[0]:=evalf(sigma[0]/EE(0));`

$$\varepsilon_0 := .003978$$

Force at 24 hrs (N)

> `F[24]:=evalf(epsilon[0]*EE(24)*A);`

$$F_{24} := 55.91$$