Physics I

Elasticity

$\Delta L = \dfrac{FL}{EA}$ (the "flea" equation)

Problem 1.- A steel cable 12 m long and has a diameter of 8mm. Calculate how much it will stretch under a tension of 4500 N.
[Young's modulus of steel = 200×10^9 N/m^2]

Problem 1a.- Calculate the elongation of a steel cable 12m long with a diameter of 16mm under a 450kg load. [Young's modulus of steel E = 200×10^9 N/m^2]

Note: The area of a circle is $A = \dfrac{\pi D^2}{4}$, where D is the diameter.