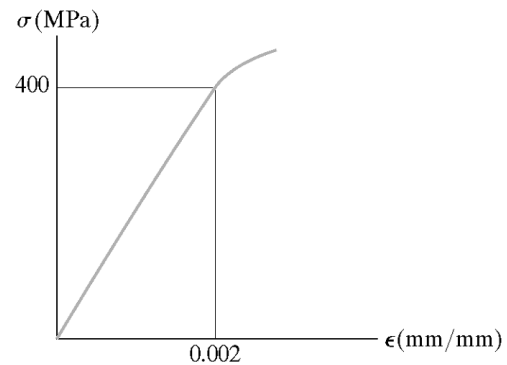1. The elastic portion of the stress-strain diagram for a steel alloy is shown in the figure. The specimen from which it was obtained had an original diameter of 13 mm and a gauge length of 50 mm. When the applied load on the specimen is 50 kN, the diameter is 12.99265 mm. Determine Poisson's ratio for the material.【一拉伸试件应力应变图的弹性部分如图所示，已知试件测试前直径为 13mm，标记长度为 50mm，在线弹性范围内，对应于 50kN 的拉力测得试件直径为 12.99265mm，试求试件材料的泊松系数。】

2. The stress-strain diagram for a steel bar is shown in the figure. Determine approximately the modulus of elasticity, the proportional limit, the ultimate stress, the fracture stress and the modulus of resilience. If the bar is loaded until it is stressed to 450 MPa, determine the amount of elastic strain recovery and the permanent set of strain in the bar when it is unloaded.【一钢杆的拉伸应力应变曲线如图所示，试求其弹性模量、比例极限、强度极限、断裂应力和回弹模量（弹性应变能密度）；若在加载到应力为 450 MPa 时卸载，试求可以恢复的弹性应变和不可恢复的永久塑性应变。】
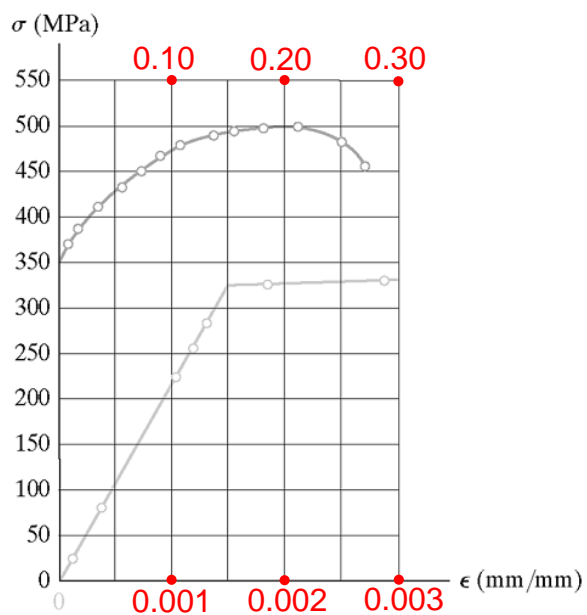
3. The stress-stain diagram for a polyester resin is given in the figure. If the rigid beam *AC* is supported by a strut *AB* and post *CD* made from this material, determine the largest load *P* that can be applied to the beam before *AB* or *CD* ruptures. The diameter of the strut is 12 mm and the diameter of the post is 40 mm.【聚酯树脂的拉压应力应变曲线如右图所示，左图中的钢梁 *AC* 由该材料制成的杆 *AB*（直径 12 mm）和 *CD*（直径 40 mm）支撑，试求 *AB* 或 *CD* 断裂前钢梁所能承受的最大荷载 *P*。】
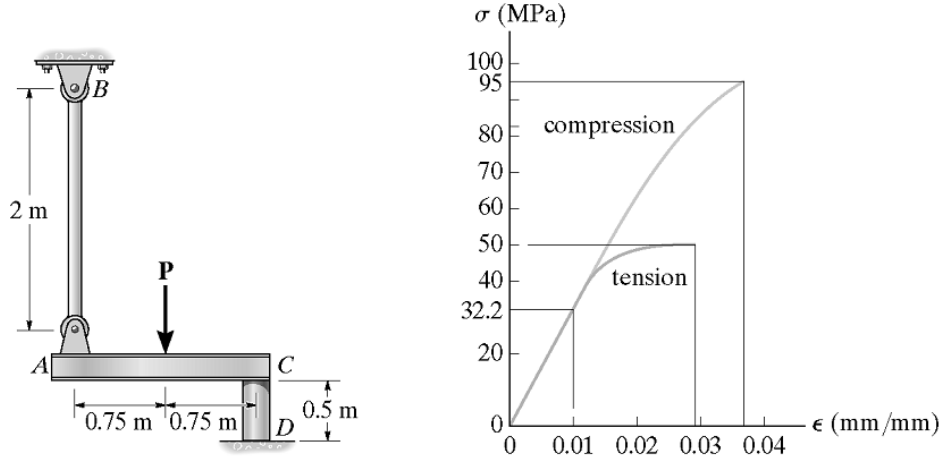
4. The steel wires *AB* and *AC* support the 200-kg mass. If the allowable axial stress for the wires is 130 MPa, determine the required diameter of each wire. Also what is the new length of wire *AB* after the load is applied? Take the unstretched length of *AB* to be 750 mm and E_{st} = 200 GPa.【图示钢索 *AB* 和 *AC* 共同支撑 200-kg 的重物，若钢索的许用轴向应力为 130 MPa，试求 *AB* 和 *AC* 的最小许用直径及 *AB* 承载后的长度。已知 *AB* 原长 750 mm 且 E_{st} = 200 GPa。】