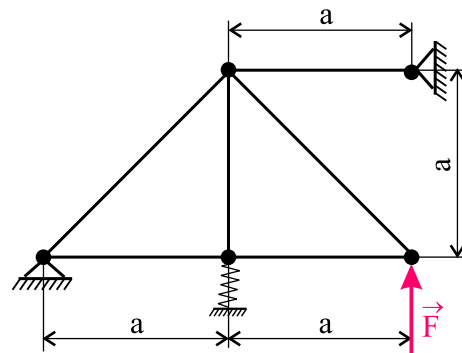


Problem 425

Determine the maximum force \vec{F} that the strut frame in the figure can be loaded upon by, so that the safety factor against the limit state of elasticity is not lower than 2. All the bars are homogeneous, of the same circular cross section with the diameter $\varnothing d$ and are made of the same material. They are joint by pin supports and by a spring of rigidity k .

Input values:

$$\begin{aligned} a &= 1 \text{ m}, & \varnothing d &= 30 \text{ mm}, \\ k &= 4 \text{ kNm}^{-1}, \\ E &= 2 \cdot 10^5 \text{ MPa}, & \sigma_K &= 350 \text{ MPa}. \end{aligned}$$



tension

systems with bars