Name_____ Student number_____

# Assignment 5 (4p)

Consider the curved beam rigidity problem on pages 1-4 to 1-8 of the lecture notes. Measure the displacement $v$ of the loading point as the function of mass $m$ used as loading. Thereafter, use the mass-displacement data to find the coefficient of relationship

$$\frac{mgR^2}{EI} = a\frac{v}{R}.$$

The values of the geometrical and material parameters are $E = 70\,\text{GPa}$, $R = 306\,\text{mm}$, $I = 3011\,\text{mm}^4$ and $g = 9.81\,\text{m/s}^2$.

***Experiment:*** The set-up is located in Puumiehenkuja 5L (Konemiehentie side of the building). The hall is open 9-12 and 14-16 on Fri 01.03.2024. Place a mass on the loading tray and record the displacement shown on the laptop display. Gather enough mass-displacement data to find the coefficient $a$ reliably. For example, you may repeat a measurement with certain loading several times to reduce the effect of random error by averaging etc. You may also consider different loading sequences (like increasing and decreasing the mass) to minimize the possible friction effects in the set-up.