

8-4. The steel bar AB with a rectangular cross section is pin connected at its ends. Load P acting on BC follows a normal distribution $P \sim N(4, 0.9^2)$ kN/m. The moment of inertia of AB follows $I_y \sim N(30 \times 10^{-9}, (3 \times 10^{-9})^2)$ m⁴. The modulus of elasticity is $E = 200$ GPa. Determine the probability of failure of bar AB caused by buckling. Assume that P and I_y are independent, and buckling happens before yield failure. (Ans. $p_f = 5.81 \times 10^{-4}$)

