

8-3. A 18 in. length rod is subject to two forces as shown. The rod has a length of 18 inches. The yield strength of the rod is $S_y = 50$ ksi, and its Modulus of elasticity is $E = 29 \times 10^3$ ksi. The moment of inertia of the rod follows $I \sim N(3 \times 10^{-3}, (2 \times 10^{-4})^2)$ in⁴ and the forces also follow a normal distribution $P \sim N(2, 0.1^2)$ kip. Find the probability of failure of the rod caused by buckling. Assume that I and P are independent. (Ans. $p_f = 5.77 \times 10^{-4}$)

