38. A force $F \sim N(22, 2^2)$ kN is applied to rod *OB* shown in the figure. Rod *OA* has a round cross section with a diameter of $d \sim N(50, 0.1^2)$ mm. If the allowable stress of rod *OA* is $S_a \sim N(10, 1^2)$ MPa, determine the probability of failure using the First Order Second Moment Method. Assume that F, d and S_a are independent.

Answer: $p_f = 4.46(10^{-5})$