

17. A circular shaft with a diameter $d \sim N(1, 0.01^2)$ in is subjected to a bending moment $M \sim N(8000, 800^2)$ lbf-in. If the yield strength is $S_y \sim N(25, 2^2)$ kpsi, and M , d and S_y are independent, determine the probability of failure using the First Order Second Moment Method.

Answer: $p_f = 7.37(10^{-6})$