15. A rotating-beam is subjected to a reversing nominal stress $S \sim N(150,\ 20^2)$ kpsi with 600 cylces. The fatigue strength fraction is $f = 0.75$. If the ultimate strength is $S_{ut} \sim N(350,\ 30^2)$ kpsi, determine the probability of failure using the First Order Second Moment Method. Note that S and S_{ut} are independent.

Answer: $p_f = 5.27(10^{-5})$