1-2. A system is used to support a normally distributed force $P \sim N(250,30^2)$ lb. For the segment AB the allowable yield stress is $S_n \sim N(35,4^2)$ psi. What is the minimum cross sectional area required of AB so that the probability of failure is less the 10^{-3}. Assume P and S_n are independent. Neglect the weight of the board and steel beam system. $\theta = 60^o$.   (**Ans.** $A = 4.4074\,\text{in}^2$)