1-5.   A block that has a normally distributed weight $W \sim N(600, 85^2)$ N is held in place on an incline by a rope as shown. If the yield stress of the rope also follows a normal distribution $S_y \sim N(5, 0.8^2)$ MPa, what is the minimum diameter that the rope must have so that the block will not break free if the probability of failure must be less than 10^{-4}? Assume W and S_y are independent variables and $\theta = 60^o$. Neglect friction.   (**Ans.** $d = 13.642$ mm)