

2-3. Bar  $AB$ , which is hung by a cable  $CD$ , is used to support a load. The weight of the bar is negligible. Force  $P_2 \sim N(600, 50^2)$  N acts on the bar at point  $A$  to support the load  $P_1$  that acts at point  $B$ . Assuming that the allowable normal stress of the cable is  $S_a \sim N(160, 15^2)$  MPa and that  $P_1$ ,  $P_2$ , and  $S_a$  are independent, determine the diameter of the cable to so that the probability of failure is less than  $10^{-4}$ . (**Ans.**  $d_{CD} > 5.07$  mm)

