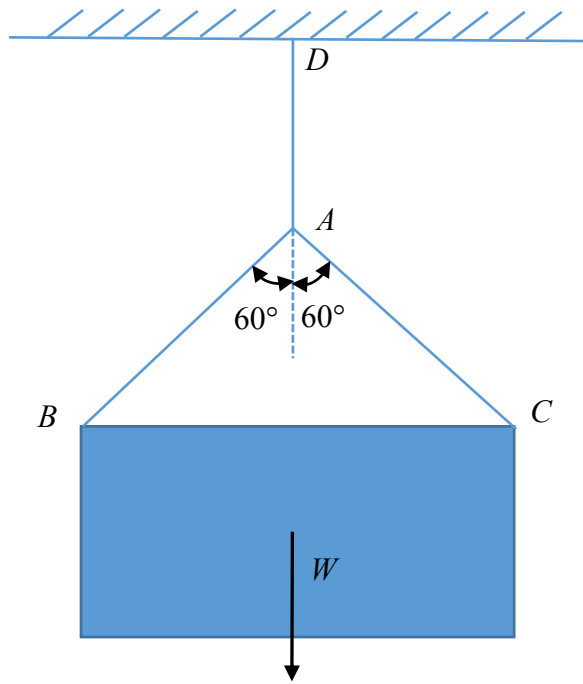


1. Cable BAC is used to lift the normally distributed load $W \sim N(120, 6^2)$ lb. If the system is in the position shown below, determine the probability that the system may fail. The allowable tension of the cable AB follows another normally distribution $T \sim N(140, 7.5^2)$ N. Assume that T and W are independently distributed.



Answer

The probability of failure is

$$\Pr = P(Y > 0) = 1 - P(Y \leq 0) = 1 - \Phi\left(\frac{-\mu_Y}{\sigma_Y}\right) = 1.87\%$$