Homework 1

The position of a slider-crank mechanism is required to be $s_a = 25$ mm when $\theta = 60^\circ$. If the actual position s is outside the tolerance range $s_a \pm 0.1$ mm, it is considered that a failure occurs. The design variables are independent and follow normal distributions of $a \sim N(11.3, 0.067^2)$ mm, $b \sim N(25.3, 0.02^2)$ mm, and $e \sim N(6.5, 0.01^2)$ mm. Use the First Order Second Moment (FOSM) method to calculate the probability of failure.

(**Ans.** $p_f = 6.4135 \times 10^{-4}$)