

13. The design team considers to use a hollow shaft to replace a solid shaft having a diameter of $d \sim N(80, 0.1^2)$ mm. If the hollow shaft has an inside diameter of $d_i \sim N(40, 0.1^2)$ mm and an outside diameter of $d_o \sim N(50, 0.1^2)$ mm, determine the mean and standard deviation of the percentage reduction in the shaft weight using FOSM. Note that d , d_o and d_i are independent.

Answers: $\mu_{\Delta W} = 85.94\%$, $\sigma_{\Delta W} = 0.20\%$