

62. Two normal stresses $S_x \sim N(10, 1^2)$ MPa and $S_y \sim N(60, 6^2)$ MPa are applied to a critical stress element shown in the figure. The modulus of elasticity is $E = 90$ MPa and the Poisson's ratio is ν is 0.3. The axial length of the element is $l_x = 1$ mm. If the allowable axial elongation is $\delta_a = 0.02$ mm, determine the probability of failure. Assume that S_x and S_y are independent.

Answer: $p_f = 7.07(10^{-4})$

