2-5. A fluid is pressurized by a piston to a normally distributed pressure $P \sim N(80, 8^2)$ psi as shown in the following two ways. The piston has a diameter of $d = 12 \text{ in}$. The allowable stress of the container wall also follows a normal distribution $S_a \sim N(950, 60^2)$ psi. Determine the minimum thickness t for both cases if the maximum probability of failure is 10^{-4}. Assume P and S_a are independent.   (**Ans.** $t = 0.77 \text{ in}$)

(a)   (b)