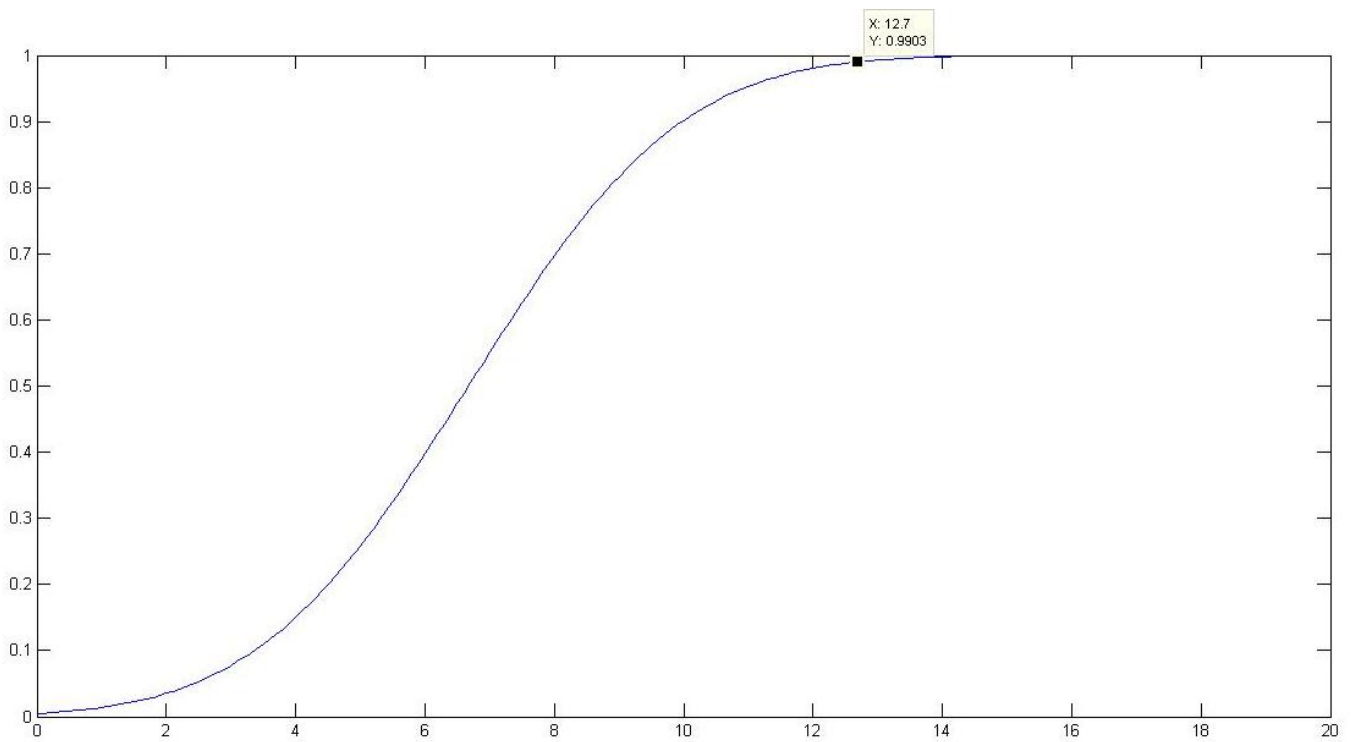


$$\begin{aligned}
 \text{Var}(x) &= E[x^2] - E[x]^2 \\
 &= \sum_{i=0}^1 x_i * pf_i - \left(\frac{1}{300}\right)^2 = x_0^2 * pf_0 + x_1^2 * pf_1 - \left(\frac{1}{300}\right)^2 \\
 &= 0 * pf_0 + 1^2 * \frac{1}{300} - \left(\frac{1}{300}\right)^2 = \frac{299}{90000}
 \end{aligned}$$

$$\text{Var}_{sum} = 2000 * \text{Var}(x) = 2000 \frac{299}{90000} = \frac{299}{45}$$

$$\sigma_{sum} \approx 2.58$$



Therefore the minimal number of telephone lines needed is 13.