$$k = \Phi^{-1}\left(1 - \frac{\alpha}{2}\right) \quad \Rightarrow \quad \alpha = 1 - \rho = 1 - 0.9 = 0.1$$

$$l = \frac{k}{2\sqrt{n}} \qquad l = 0.02 \qquad k = 1.6449$$

$$l = \frac{k}{2\sqrt{n}} \quad \Rightarrow \quad l \cdot 2 \sqrt{n} = k$$

$$n = \left(\frac{k}{l2}\right)^2 = \left(\frac{1.6449}{0.02 \cdot 2}\right)^2$$

$$n = 1691$$