Since $n \to \infty$, it is continuous set of random variables

As there is a uniform distribution between 0 and θ,

the p.d.f. $f(x) = \text{constant}$.

Since $\int_0^\theta f(x) = 1 \Rightarrow f(x) = 1/\theta$

$$P(a \leq X \leq b) = \int_a^b 1/\theta \, dx.$$

Given: $P(X < \epsilon) \leq \frac{E(X)}{\epsilon}$

$$\left[E(X) = \int_0^\theta x f(x)\, dx = \theta/2 \right]$$

$$P(X_{n-13} < \theta - \epsilon) \leq \frac{\theta/2}{\theta - \epsilon}$$

$$P(X_{n-13} < \theta - \epsilon) \leq \frac{\theta}{2(\theta - \epsilon)} \quad \forall \epsilon > 0$$

As $\epsilon \to \infty$, $\frac{\theta}{2(\theta-\epsilon)} \to 0$

Hence, $P(X_{n-13} < \theta - \epsilon) = 0$ since inequality holds $\forall \epsilon > 0$.

Also, $P(X_{n-13} > \theta + \epsilon) = 0$ since the distribution of X is from 0 to θ and $\epsilon > 0$

Hence, combining them

$$\lim_{n \to \infty} P(|X_{n-13} - \theta| > \epsilon) = 0$$ (Hence, X_{n-13} converges to θ as $n \to \infty$)