Question 9 **(6 marks)**

The time T in minutes that a particular flight arrives later than its scheduled time is uniformly distributed with $-30 \leq T \leq 60$. The population mean is $\mu(T) = 15$ and the population variance is $\sigma^2(T) = 675$.

A sample of 30 arrival times is taken and the sample mean $\overline{T}$ is calculated.

(a)   Determine $P(10 \leq \overline{T} \leq 20)$ correct to 2 decimal places.   (3 marks)

(b)   If a large number of samples, each with 30 arrival times, is taken, sketch the likely distribution of the sample mean $\overline{T}$ below.

In the diagram indicate or refer to the calculation from part (a).   (3 marks)