7. The continuous random variable X is uniformly distributed over the interval

$$[k - 6, k + 10]$$

where k is a constant.

A random sample of 80 observations of X is taken.

Given that $\bar{X} = \frac{1}{80}\sum_{i=1}^{80} X_i$

(a) use the Central Limit Theorem to find an approximate distribution for $\bar{X}$
Give your answer in terms of k where appropriate.

(3)

Given that the 80 observations of X have a sample mean of 17.5

(b) find a 99% confidence interval for the lower quartile of the distribution of X

(4)

(Total for Question 7 is 7 marks)

TOTAL FOR PAPER IS 75 MARKS