To find the numerical solutions, you can use the statistical tables or the commands \texttt{pnorm} and \texttt{qnorm} in R.

(1)[4 Pts] Let $X$ be the mean of a random sample of size $n = 48$ from the uniform distribution in the interval $(0, 2)$. Approximate the probability $P(0.9 < X < 1.1)$ using the Central Limit Theorem.

(2)[4 Pts] Let $X$ be the mean of a random sample of size $n = 48$ from a distribution with mean 4 and variance 16. Approximate the probability $P(3.1 < X < 4.6)$ using the Central Limit Theorem.

(3)[4 Pts] The profits from investments in individual stocks follow a normal distribution with mean 1 and standard deviation 5.

(a) If are buying a single random selected stock, what is the probability that your profit is greater than zero?

(b) If are buying a portfolio of 25 randomly selected stocks, what is the probability that your average profit is greater than zero?

(4)[4 Pts] The mean and standard deviation measured from a randomly selected sample of $n = 42$ mathematics SAT test scores are $\bar{x} = 680$ and $s = 35$. Find an approximate 99 percent confidence interval for the population mean $\mu$. 