Problem 1 (20 points, 4 points for each part)

Consider the filling operation for 20-oz bottles of a popular soft drink. Assume the volume of drink filled in the bottle follows a normal distribution with the mean of 20.2 oz and the standard deviation of 0.40. A recent random sample of 12 bottles yielded these volumes:

20.1	20.1	20.0	19.9	20.5	20.9
20.1	20.4	20.2	19.1	20.1	20.0

(1) Use R to find the sample mean, sample variance, and sample standard deviation of this data. You can use the following R code to create the data:

```
drink <- c(20.1, 20.1, 20.0, 19.9, 20.5, 20.9, 20.1, 20.4, 20.2, 19.1, 20.1, 20.0)
```

(2) Draw the Q-Q plot for this data and comment on its normality.

(3) Find the probability that the volume of drink filled in a random selected bottle is less than 20.1 oz. Please provide sufficient details and use the normal table for your calculation.

(4) For a sample of 12 bottles, find the probability that the sample mean is less than 20.1 oz. Please provide sufficient details and use the normal table for your calculation.

(5) Use R function pnorm() to calculate the probabilities in (3) and (4).