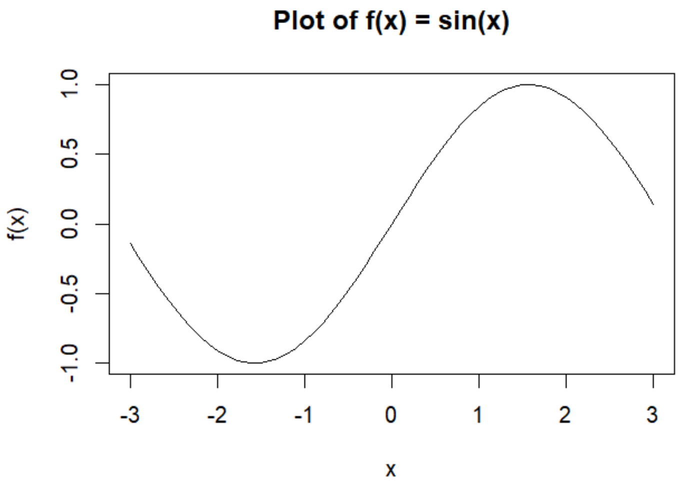
Question 1

```
# Generate x values in the interval (-3, 3) with a step size of 0.1

x <- seq(-3, 3, 0.1)

# Compute the corresponding y values using the sin function

y <- sin(x)

# Plot the function

plot(x, y, type = "l", xlab = "x", ylab = "f(x)", main = "Plot of f(x) = sin(x)")
```



Question 2

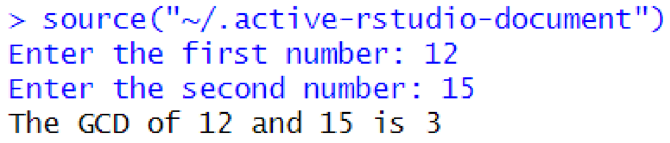
```
# Probability of suffering from the disease

p <- 0.2

# Number of workers

n <- 6

# Calculate the probability of four or more workers suffering from the disease

prob <- sum(dbinom(4:n, size = n, prob = p))

# Print the result

cat("The probability that four or more workers will suffer from the disease:", prob)
```

Output:

```
The probability that four or more workers will suffer from the disease: 0.01696
```

Question 3

```
# Function to compute GCD using recursion
gcd_recursive <- function(a, b) {
  if (b == 0) {
    return(a)  # Base case: GCD is a when b is 0
  } else {
    return(gcd_recursive(b, a %% b))  # Recursive call with updated values
  }
}

# Read input numbers from the user
a <- as.integer(readline("Enter the first number: "))
b <- as.integer(readline("Enter the second number: "))
# Compute the GCD using recursion
result <- gcd_recursive(a, b)
# Print the result
cat("The GCD of", a, "and", b, "is", result)
```

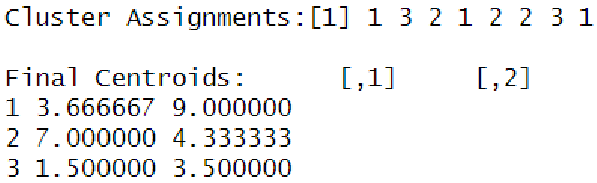


```
> source("~/.active-rstudio-document")
Enter the first number: 12
Enter the second number: 15
The GCD of 12 and 15 is 3
```

Question 4

```
# Define the data points
data <- matrix(c(2,10,2,5,8,4,5,8,7,5,6,4,1,2,4,9), ncol = 2, byrow = TRUE)
# Define the initial centroids
initial_centroids <- matrix(c(2,10,5,8,1,2), ncol = 2, byrow = TRUE)
# Perform k-means clustering
kmeans_result <- kmeans(data, centers = initial_centroids)
# Get the cluster assignments
cluster_assignments <- kmeans_result$cluster
# Get the final centroids
```

```
final_centroids <- kmeans_result$centers

# Print the cluster assignments and final centroids

cat("Cluster Assignments:")

print(cluster_assignments)

cat("\nFinal Centroids:")

print(final_centroids)
```



```
Cluster Assignments:[1] 1 3 2 1 2 2 3 1

Final Centroids:      [,1]     [,2]
1 3.666667 9.000000
2 7.000000 4.333333
3 1.500000 3.500000
```