you can reject the null hypothesis that the mean difference is equal to 0, and conclude that the students have benefited from the training.

11)100 individuals of a particular race were tested with an intelligence test and classified into two classes.
Another group of 120 individuals belong to another race were administered the same intelligence test and classified into the same two classes. The following are the observed frequencies of the two races:
Race Intelligence
Intelligent Non-intelligent Total
Race I 42 58 100
Race II 55 65 120
Total 97 123 220
Test whether the intelligence is anything to do with the race.

To test whether the intelligence is associated with the race, you can perform a chi-squared test for independence. The chi-squared test compares the observed frequencies in the contingency table to the expected frequencies under the assumption of independence between the two variables.
Here's how you can perform the chi-squared test in R:

```
# Define the contingency table
table <- matrix(c(42, 58, 55, 65), nrow = 2, byrow = TRUE)
colnames(table) <- c("Intelligent", "Non-intelligent")
rownames(table) <- c("Race I", "Race II")

# Perform the chi-squared test using the chisq.test function
result <- chisq.test(table)

# Extract the p-value from the result
p_value <- result$p.value

# Check if the p-value is less than the significance level (0.05)
if (p_value < 0.05) {
  print("There is evidence that the intelligence is associated with the race.")
} else {
  print("There is no evidence that the intelligence is associated with the race.")
}
```

The chisq.test function takes the contingency table as an argument and returns the test statistics, including the chi-squared statistic, the degrees of freedom, and the p-value. If the p-value is less than the significance level (0.05), you can reject the null hypothesis that the intelligence and the race are independent, and conclude that there is evidence that the intelligence is associated with the race.

14) Obtain the correlation coefficient between the heights of father(X) and of the son (Y) from the following
data
X 65 66 67 68 69 70 71 72
Y 67 68 65 68 72 72 69 71
And also test its significance. Using R functions.

To obtain the correlation coefficient between the heights of the father (X) and the son (Y), you can use the cor function in R. The cor function calculates the Pearson correlation coefficient, which measures the linear relationship between two variables.
Here's how you can use the cor function in R:

```
# Define the data
x <- c(65, 66, 67, 68, 69, 70, 71, 72)
y <- c(67, 68, 65, 68, 72, 72, 69, 71)

# Calculate the correlation coefficient
```