3. a. We will use a two-sided unpaired t-test for this question because it is used to compared two population means.

According to the information given, we can test the below hypothesis

Ho: μA - μB = 0

Which means that there is no difference between two servers

Ha: μo - μn ≠ 0

Which means that the two servers are different from each other

Because the two samples have different variances, we use the below formula to calculate the test statistics. This gives us a t-stat of -2.76

The critical value for an α = 0.05 is -1.96. Since -2.76 < -1.96, the t-stat is within the rejection area. Therefore we reject the null showing that the two servers are different.

b. We still use an unpaired t-test but it is one-sided with a slight different hypothesis testing.

Ho: μA - μB ≥ 0

Which means server A is no faster than server B

Ha: μA - μB < 0

Which means server A is faster than server B

The t-stat is still -2.76 as calculated in part a. The critical value for a one-sided t-test with a 5% α is -1.645. Since -2.76 < -1.645 meaning that we reject the null and claim that server A is significantly faster.