Question 1

a) The Advance cable network claims that the average customer watches 48 hours or less of a sport channel per month. They collect data on 48 individuals' sport channel viewing habits and find that the mean number of hours that the 48 customers spent watching the sport channel was 49.6 hours. If the standard deviation of all Advance's customers is nine hours, can we conclude at the 1% significance level that they are right?

b) The Advance cable network also hired a researcher to determine customers' sport channel viewing habits between Toronto and Windsor. They took a random sample of 7 customers in Toronto and 5 customers in Windsor and asked each of them to report the number of hours watching the sport channel over a set period of time. The results are shown in the table below. Estimate with 1% significance level the differences in the average hours of watching the sport channel between Toronto and Windsor.

	Average	Sample Standard Deviation
Toronto	35.3676	97.6964
Windsor	30.1875	112.5667

Question 2

With voter turnout during presidential elections around 43%, a vital task for politicians is to try to predict who will vote. A variable used to determine who is likely to vote was created and defined as follows. INTENT: 1 = Definitely will not vote; 2,3,4,5,6,7,8,9,10= Definitely will vote. A pollster conducted a survey that recorded the variable as well as age, education, and income. The following output is provided:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.36372197
R Square	0.132293672
Adjusted R square	0.107502062
Standard Error	2.690059588
Observations	109

ANOVA

	Df	SS	MS	F
Regression	3	115.8455631	38.61518769	5.336227658
Residual	105	759.8241617	7.236420588	
Total	108	875.6697248		

	Coefficients	Standard Errors	t Stat
Intercept	2.326931814	2.007356844	1.159201873
AGE	0.021456726	0.015607187	1.374797704
EDUC	0.276746279	0.133059881	2.07986266
INCOME	1.66514E-05	7.30326E-06	2.279999319

a) State the population regression model.

b) Test the model's validity at 97.5% confidence.

c) Test to determine whether there is evidence at the 1% significance level to infer that income plays a factor in voter intent.

Question 3

Cannabis sold in dispensaries is made up of several important elements, the most important being THC. Several firms sell their product through the dispensaries. You are given the following information about the amount of THC (in milligrams) in a gram of Cannabis. The Consumer Advocates of Canada decided to collect samples as part of their consumer advisory newsletter.

In a sample of 21 from Firm ACD, the mean amount of THC was 19.35 milligrams with a variance of 0.0058.

The sample of Firm MFM was 27 with a mean of 19.47 and a variance of 0.0562.

The sample from Firm GH had a mean of 19.16 and a variance of 0.0330 for 19 purchases.

a) Test to determine whether there is sufficient evidence that GH's product is within 1 milligram of 19.16. Use an Alpha of 1%

b) Consumer Advocates also wanted to determine whether MFM's product had a higher-level of consistency in relation to THC then that of GH's product. Use an Alpha of 5%.

c) Consumer Advocates wanted to observe whether all firms were offering the same level of THC in their products or whether there was a difference. Calculate the appropriate Test Statistic value for this test (do not complete the full hypothesis test).