

HMWK 1

1. (a) Since the calculated t-statistic, 4.81, is greater than the calculated critical value of 4.32, the null hypothesis—that the concentration in the sampled region exceeds the stated background value—is accepted. The result does not surprise me because 45.31 is much greater than 20.
- (b) Given that the p-value is 0.99, I would say that it is extremely likely.
- * 2. (a) Despite the fact that the distribution is not normal (the proposed mean is nowhere near the median for the range provided), because there are sufficiently many entries in the population, the central limit theorem allows us to test the hypothesis about the value of the population mean consumption.
- (b) Upon running a t-test, under the following hypothesis

$$H_0 : \mu < 200, H_a : \mu > 200$$

did not fall under the critical region. So the null is rejected, implying that the mean consumption was not at most 200mg.

3. No, the data does not suggest that the condition has not been met as the average is within the critical region.
4. (a) The relevant test statistic in this case would be testing for proportion. Consider the following hypothesis:

$$H_0 : \hat{p} = p_0$$

$$H_a : p_0 > \frac{1}{75} \text{ or } \frac{1}{75} < -\hat{p}$$

It can be concluded that the rate of the chromosome defect in question differs from the presumed rate. A Type 1 Error could have been made when arriving at the conclusion.

- (b) The pnorm calculated came out to be 0.089. So, it would have been rejected at a significance level of 0.2.
5. Since the calculated zscore was 0.74 and the associated pnorm was 0.77, both of which are greater than the expected proportion, 0.10, it can be concluded that more than 10% of the population has abstained from alcohol use.