Problem 1: Claw development in lobsters.

**Question 1.** State the null and alternative hypotheses.

**Question 2.** What is the expected number of animals with two cutter claws in the smooth plastic treatment if the null hypothesis is true? (Show your calculations/work.)

**Question 3.** What are the degrees of freedom for this contingency test? df = ____

**Question 4.** What is meant by the third row in each cell (“chi square contributions”). Explain by showing the calculations that lead to the number “7.679” (1st row of cells, right hand column).
Question 5. Interpret the results of this study, and make sure to include your sample size (n), test statistic, degrees of freedom, and P-value (don’t just state “significant” or “non significant” – explain the new biological insights we learned).

Question 6. If one reads the original study, each lobster was raised in its own box. This was partly done because lobsters can be aggressive with each other. However, it also was a good statistical practice. What statistical problem was avoided by this approach (hint: this is a subject of one of Whitlock’s “interleafs”)?

Problem 2: Child restraints and injuries following an accident.

Question 7. State the null and alternative hypotheses for this problem.

Question 8. Write out the contingency table on your study sheet (make sure to label your rows and columns and include the row and column totals).
Question 9. Which combination of “restraint” and “status” has the largest “contribution to the Chi Square”? Interpret this information: what does the results of this “cell” tell you about child safety?

Question 10. Interpret the results of this study, and make sure to include your sample size (n), test statistic, degrees of freedom, and P-value. Make sure you explain major patterns in the data.

Question 11. List the odds of serious status given a child seat, the odds of serious status given a lap belt, and the odds ratio.

Question 12. Calculate a 95% confidence interval for the odds ratio. What does this tell you about the study? Is it consistent with your answer to question 10? (Hint: look at the summary on pp. 1-2 of the lab handout.)