Question 6.2 (10 pts)

    a. The fitted-line plot (Figure 1) suggests that the logistic regression model fits the proportions that had consumed a *Daphnia* by length fairly well as indicated by the relative closeness of the modeled line to the observed proportions (i.e., blue pluses).
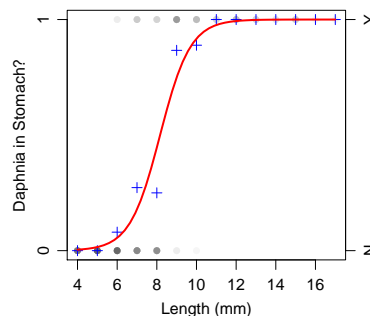

Figure 1. Fitted plot for the logistic regression of whether or not a larval ruffe had consumed a *Daphnia* or not and the length of the ruffe.

    b. There is a significant relationship between the probability of consuming a *Daphnia* and the length of the ruffe as indicated by a p-value for the slope of the logistic regression ($p<0.00005$) that is less than 0.05.

    c. The relationship between the probability of having consumed a *Daphnia* and the length of the ruffe cannot be described with any given number and must be described from (Figure 1). From (Figure 1) it is seen that this probability is "low" until about 6 mm, rises sharply to about 10 mm, and then stays high above 10 mm. One could note that the odds of consuming a *Daphnia* are between 2.5388 and 6.1107 times greater for each increase of 1 mm in larval ruffe length.

    d. The odds that a 6-mm long larval ruffe had consumed a *Daphnia* is 0.0584, which means that the probability that a 6-mm long larval ruffe had consumed a *Daphnia* is only 0.0584 times the probability that it had not consumed a *Daphnia*. This indicates that the 6-mm long larval ruffe was 17.12 times more likely to not have consumed a *Daphnia* then it was to have consumed a *Daphnia*.

    e. The probabiilty that a 6-mm long larval ruffe had consumed a *Daphnia* is 0.0552.