SMM637 Case Study - Model for Binary Data

Data on the 23 space shuttle flights that occurred before the Challenger mission in 1986 are given in the following table. For each of the 23 missions, data on the temperature, in ^oF, at the time of flight (Temp.), and whether at least one primary O-ring suffered thermal distress (TD) were recorded.

Temp	TD	Temp	TD	Temp	TD
66	0	57	1	70	0
70	1	63	1	81	0
69	0	70	1	76	0
68	0	78	0	79	0
67	0	67	0	75	1
72	0	53	1	76	0
73	0	67	0	58	1
70	0	75	0		

Fit a logistic regression model between TD and Temp.

Assuming, for the sake of argument, that the model does provide a good fit, using this model answer the following tow questions.

Question 1: What is the predicted probability of thermal distress at 31^oF (supposedly the temperature at the time of the Challenger flight)?

Question 2: At which temperature is it estimated that there is a 50% chance that thermal distress occurs?

Finally, produce a plot of the observed data and fitted model.