Solutions to the Exercises of Section 2.6.

2.6.1. In the risk set given by Figure 1.9, the lower boundary is given by the two closed line segments, one from $(-2, 3)$ to $(-3/4, -9/4)$, and the other from $(-3/4, -9/4)$ to $(3, -4)$. The minimal complete class, D_0, is the set of rules whose risk points lie on one of these segments. From Table 1.7, these are the rules that randomize between d_1 and d_2 in arbitrary proportions (take action 1 if 1 is observed and randomize between 1 and 2 if 2 is observed), and the rules that randomize between d_2 and d_4 in arbitrary proportions (take action 2 if 2 is observed and randomize between 1 and 2 if 1 is observed).

2.6.2. In the solution to Exercies 1.7.3, we found that the risk set is

$$S = \{(x, y) : 0 \leq x \leq 1, \frac{1-x}{2} \leq y \leq \frac{1}{2} + \frac{1-x}{2}\}.$$

This is closed and bounded and the lower boundary is the line segment $\lambda(S) = \{(x, y) : 0 \leq x \leq 1, y = (1-x)/2\}$. The set D_0 of decision rules corresponding to points on this line segment form a minimal complete class. These are the the decision rules that take action 1 if $X = 0$ and randomize with any weights on actions 0 and 1 if $X > 0$. This is the class of admissible decision rules.