Mathematics 1550H – Introduction to probability
Trent University, Summer 2017
Assignment #2
"The only way to win is cheat"
Due on Wednesday, 5 July.

You run afoul of the Mathematical Inquisition unexpectedly*. Maybe you divided by zero, maybe you computed a derivative at a discontinuity, it doesn't matter. For whatever heinous offence you committed you are given an unfair but otherwise standard die, whose bias you do not know, and told to use it to solve the following tasks.

1. Use the die to simulate a fair coin. *[4]*

Note. That is, you need to figure out how to use the biased die – whose probabilities you do not know – in some process that has two equally likely. outcomes.

2. Use the die to simulate a fair standard die. *[3]*

3. Use the die to simulate a biased coin with $P(H) = \dfrac{41}{123}$ and $P(T) = \dfrac{82}{123}$. *[3]*