
Project 2

QRMS, Fall 2010, Section 007

Due Fri., Dec. 10, 2010

Problem 1: Winning the Lottery vs. Being Struck By Lightning. People sometimes say that you have better odds of being struck by lightning than of winning the lottery. Investigate these claims by looking at two major US lottery games, the Powerball Lottery and the Mega Millions Lottery. Do your own odds calculations for each of the possible prizes (for Powerball: the possible prizes are for getting no number and one Powerball, one number and one Powerball, etc.; for Mega Millions: no normal balls and one Mega ball, one normal ball and one Mega ball, etc.). Then compare these odds with the (empirical) odds of being struck by lightning in the US. Consult, for example, <http://www.lightningsafety.noaa.gov/medical.htm>. Whichever sources you consult, make sure to cite them. The basic rules can be found online, whether at the official websites themselves (<http://www.powerball.com/>, <http://www.megamillions.com/>, http://www.powerball.com/megamillions/mm_main.asp) or at secondary sites like Wikipedia (<http://en.wikipedia.org/wiki/Powerball>, <http://en.wikipedia.org/wiki/Megamillions>).

Problem 2: The Odds of Winning at Roulette. Calculate the odds of winning the various inside and outside bets in a roulette game:

(1) **Inside Bets:**

- (a) Straight-up.
- (b) Split.
- (c) Street.
- (d) Corner.
- (e) Six Line.
- (f) Trio.
- (g) Basket.
- (h) Top Line.

(2) **Outside Bets:**

- (a) 1 to 18.
- (b) 19 to 36.
- (c) Red or black.
- (d) Even or odd.
- (e) Dozen bets.
- (f) Column bets.
- (g) Snake bet.

The rules and bets described above are all available online (for example, on the Wikipedia page <http://en.wikipedia.org/wiki/Roulette>). Show all work for these calculations: describe the

sample space, the events, and the methods you used to get your results. For completeness, be sure to also explain the house advantage. (Note, the odds can be found online, but to get credit, you must show *how* you get these odds.)

Altogether, you should have at least two pages of work for this project. Be sure to staple these and to put your name on it.