

Probability, HW5

Practice problems:

1. In a “street bet” in roulette you bet on three numbers (a row on the roulette table, also see Examples 2.15 and 2.16). If any of these numbers show, you win, otherwise you lose your wager. Let X be your gain if you bet one dollar on a street bet.

(a) What should the payout be in order to keep the expected gain at $-2/38$ dollar?

(b) Find the variance of X . How does it compare to straight bets and odd bets?

2. Book, page 148–: 36, 38, 42, 43.

Turn-in problems

1. In a “five number bet” in roulette you win if any of the numbers 00, 0, 1, 2, or 3 come up.

(a) In order to get the usual expected gain of $-2/38$, what should the payout be if you wager a dollar?

(b) The actual payout on this bet is 6:1. What is your expected gain?

2. In an ordinary coordinate system, start at the point $(0, -1)$. Choose an angle ϕ at random in $(-\pi/2, \pi/2)$ and draw a straight line from the point $(0, -1)$ to the point $(X, 0)$ on the x axis, such that the angle between this line and the y axis is ϕ .

(A more (or less) romantic version is that the Sheriff of Dodge City for some reason stands in front of a long wall, then spins around and fires a random shot at the wall.)

(a) Find the range and pdf of X .

(b) What is the expected value of X ?