Mathematics 1550H – Introduction to probability
TRENT UNIVERSITY, Winter 20175

Assignment #2
Probable areas?
Due on Thursday, 16 February, 2017.

1. You toss a circular coin randomly onto the Adversary's† infinite checkerboard. That is, it is as likely to turn up in one location as any other location. The coin's diameter is exactly half the length of the sides of the squares of the checkerboard, and the coin does not come to rest on its edge. If the coin touches a side of one or more of the squares, the Adversary keeps it; if it does not, the Adversary returns the coin and gives you three more coins. Is this a fair game? Explain why or why not. *[4]*

2. Suppose two real numbers, b and c, are randomly chosen from the the interval $[-1, 1]$. In each case, any real number in the interval is as likely to be chosen as any other, and it is possible for the two numbers to be equal. What is the probability that the equation $x^2 + bx + c = 0$ has two real solutions? *[6]*

An equation limerick:

$$\frac{12 + 144 + 20 + 3\sqrt{4}}{7} + 5 \cdot 11 = 9^2 + 0$$

A dozen, a gross, and a score,
Plus three times the square root of four,
    Divided by seven,
    Plus five times eleven,
Is nine squared and a not a bit more!

[Posted to the newsgroup `sci.math` by Ralph Ray Craig sometime in the 1990's.]

† No, not Phil of the Pitchspoon.