**Math 180 Fall, 2014 Assignment 3. Games**

*This assignment is due Thursday, September 18.*

1. A game which is mathematically “fair” might in fact be unfair depending on the comparative resources of the players. The “matching pennies” game is fair, but since each player has only a finite number of pennies, it will ultimately end with one player having all the pennies and the other none. Intuitively, the player starting with the larger number of pennies will have the advantage. For extra credit, you might want to research just what the odds are in this game before I give the answer in class. For this assignment, consider the following games.

BOB BOB

|  |  |  |
| --- | --- | --- |
| BOB | | |
| A  L  I  C  E | 1010 | 5 | -1000 |
| -5 | -4 | -5 |
| -1000 | 5 | 1010 |

|  |  |  |  |
| --- | --- | --- | --- |
| A  L  I  C  E | 11 | 5 | -1 |
| -5 | -4 | -5 |
| -1 | 5 | 11 |

|  |  |  |  |
| --- | --- | --- | --- |
| A  L  I  C  E | 110 | 5 | -100 |
| -5 | -4 | -5 |
| -100 | 5 | 110 |

BOB

GAME TABLES WITH DIFFERENT DEGREES OF RISK

Here are the tables for three two person zero sum games; by convention the entries in the boxes are the payoffs to the player on the left (Alice). Are these games “FAIR”? *Compute the values of the three games and discuss how they might be played by players with varying amounts of capital or risk aversion.* Can you think of realistic situations which might be reflected by these games.

2. You represent the plaintiff, Robert Williams, in a personal injury case. Liability is fairly

clear, but there is a big dispute over damages. Your occupational expert puts the plaintiff’s

expected future losses at $1,000,000, and the defendant’s expert estimates the loss at only

$500,000. (Pursuant to a pretrial order, each side filed preliminary expert reports last month and

each party has taken the deposition of the opposing party’s expert.) Your experience tells you

that, in such a situation, the jury is likely to split the difference, awarding some figure near

$750,000.

The deadline for submitting any further expert reports and final witness lists is rapidly

approaching. You contemplate hiring an additional expert, at a cost of $50,000. You suspect

that your additional expert will confirm your initial expert’s conclusion. With two experts

supporting your higher figure and only one supporting theirs, the jury’s award will probably be

much closer to $1,000,000 — say, it would be $900,000.

You suspect, however, that the defendant’s lawyer is thinking along the same lines. (That

is, they could find an additional expert, at a cost of about $50,000, who would confirm their

initial expert’s figure. If they have two experts and you have only one, the award will be much

closer to $500,000 — say, it would be $600,000.)

If both sides hire and present their additional experts, in all likelihood their testimony will

cancel out, leaving you with a likely jury award of about $750,000.

What should you advise your client with regard to hiring an additional expert?

Any other ideas?