Econ 431
Solution to Problem Set #5

2. Solve the equation

$$\pi (r, L) = \pi (r, R)$$

i.e., $$r (1) + (1- r) (-1) = r (-1) + (1- r) (1),$$

which yields $r = 1/2$, and the value of each side of the equation is zero.

3. Using the spreadsheet you've constructed for this problem:

(a) Pam has approximately a .84 chance of winning the match if she needs only 45 points.

(b) If Pam mixes .48 on Heads and .52 on Tails, then Eva's best response (which imposes on Pam her worst case, since this is a constant-sum game) is Heads. This will reduce Pam's probability of winning 50 or more points to only about .34.

4. Kidd will score a goal with probability

$$(4/9)(2/3) + (2/9)(1) + (2/9)(5/6) + (1/9)(1/3) = 20/27,$$ instead of 2/9, or 21/27.

5. Goalie's mix on (L, R) is (3/5, 2/5) and Kicker's is (4/5, 1/5). Note that the Kicker has increased his mixture probability on Left, despite the fact that his probability of scoring when he kicks Left has decreased. Of course, now his probability of scoring a goal (using his new minimax mixture) has decreased as well, to 11/15 = .7333 from 7/9 = .7778.

6. Gomez should use his minimax mixture (3/5, 2/5), assuring that he will win the match with probability about .84, since his probability of winning at each point is now 4/15 = .2667.