

# Problem 17: Prediction Markets

USMA D/Math Problem of the Week

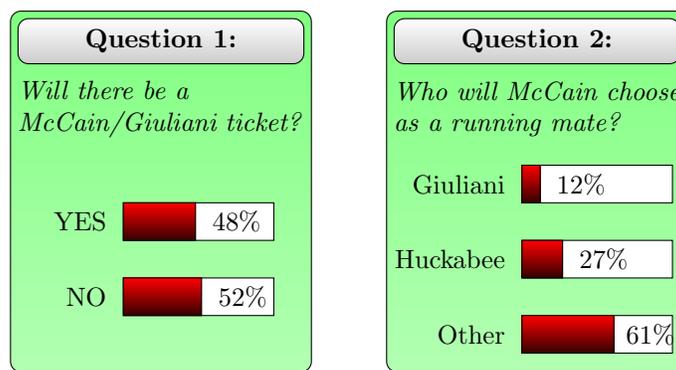
**Submission Deadline:** April 3, 2008 at 1600

**Circle one:**  cadet  faculty  non-usma student  non-usma faculty  other

## Problem Statement:

In the online prediction market [www.hubdub.com](http://www.hubdub.com), you can place bets on particular event outcomes to earn “Hubdub dollars”. If you place a bet of  $B$  on an outcome with current probability  $p$ , you earn  $B\frac{1}{p}$  if the outcome actually occurs, and 0 otherwise. For example, if the current probability of an event is 30% and you place 30 H\$ on the “YES” option, you receive 100 H\$ if the event occurs, for a net gain of 70 H\$. The probabilities fluctuate as users place bets on particular outcomes.

In one such market, the probability that there will be a McCain/Giuliani ticket stands at 48 percent. In another, the probability that out of several choices Giuliani will be the Republican Vice Presidential candidate stands at 12 percent.



What is the minimum amount you must bet in order to be *guaranteed* a net gain of 100 Hubdub dollars, *regardless of whether Giuliani is selected or not*?

Submit your answer to Dr. Elisha Peterson at [ae3263@usma.edu](mailto:ae3263@usma.edu) with the subject line **WP POTW...** or drop your solution off in my mailbox or on my desk (with date and time please!)