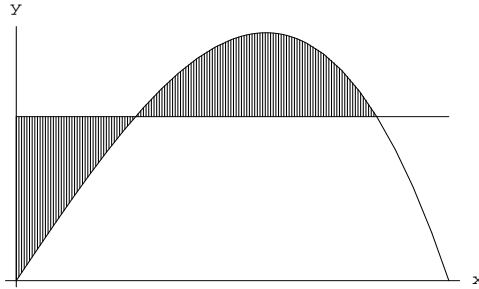

Putnam Problems for September 30th, 2003

Problem 1. The horizontal line $y = c$ intersects the curve $y = 2x - 3x^3$ in the first quadrant as pictured below. Find c so that the areas of the two shaded regions are equal. (54th Putnam, 1993.)



Problem 2. You have coins C_1, C_2, \dots, C_n . For each k , coin C_k is biased so that, when tossed, it has probability $\frac{1}{2k+1}$ of falling heads. If the n coins are tossed, what is the probability that the number of heads is odd? Express the answer as a rational function of n . (62nd Putnam, 2001.)

Problem 3. Given that x_1, x_2, \dots, x_n is a permutation of the numbers $1, 2, \dots, n$, find the largest possible value, as a function of n , of $x_1x_2 + x_2x_3 + \dots + x_{n-1}x_n + x_nx_1$. (57th Putnam, 1996.)