

CONTEST

Staten Island Math Contest

Write your solution to either (or both) of the following problems down, and turn it in to the math office (1S 215). Just ask them to give it to Prof O'Bryant. I'll read the solutions received before December, and announce the best solutions in the tutoring room on the second floor of 1S on Tuesday, December 5, at 3:30 pm.

Problem A: Consider all lines which meet the graph of

$$y = 2x^4 + 7x^3 + 3x - 5$$

in four distinct points, say $(x_i, y_i), i = 1, 2, 3, 4$. Show that

$$\frac{x_1 + x_2 + x_3 + x_4}{4}$$

is independent of the line and find its value.

Problem B: Mark is taking a trip and is taking along exactly \$1020 in cash. His father gives him cash for the trip in denominations of 20 dollar bills and 50 dollar bills only. How many denominations of each (\$20's and \$50's) are possible? How many are possible if he takes a total of \$10200? Hint: you may want to explore the euclidean algorithm and/or diophantine equations for working through this problem systematically.