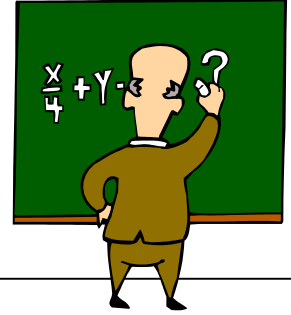


# Problem of the Week

January 19 – January 25, 2010



Recently, Mr. Imbelli hailed a cab on 3<sup>rd</sup> Avenue here in New York. He jumped in, and the cab headed north. The cab never turned, and when he got out Mr. Imbelli was still on 3<sup>rd</sup> avenue, just further uptown.

"That's cool," he said. "If I add up all the street numbers that I passed during that ride, the sum is 1,000."

Between which streets did Mr. Imbelli travel?

(Consult a map to be sure you answer is geographically accurate!)

### *Solution of the Week*

First, I thought of a street number called  $a$ . Then, I made a chart that shows all the streets surrounding  $a$ , like this:

$$\dots a-3, a-2, a-1, a, a+1, a+2, a+3 \dots$$

Then, I realized that if you add  $a-1$  and  $a+1$ , you always get  $2a$ . Let's assume Mr. Imbelli passed an odd number of streets. I figured out that the sum of all the street numbers he passed would be  $a$  (the middle street) times the number of streets he crossed. We know that if that is true, then the equation  $a \times$  the number of streets must equal 1,000, or  $2^3 \times 5^3$  when broken down into primes. But because we assumed that Mr. Imbelli passed an odd number of streets, our number of streets must be  $5^1$ ,  $5^2$ , or  $5^3$ . Now, we just have to see how it works out. If the number of streets was 5, the middle street number must be 200, but there is no such 200<sup>th</sup> St. on 3<sup>rd</sup> Ave. If the number of streets was  $5^2$ , or 25, the middle street number must be 40, which works out. But to double-check, I thought that if the number of streets were 125, then the middle street number would be 8, but even though there are such things as Christopher St. and stuff like that, those aren't street NUMBERS. So 125 wouldn't work out. So the answer must be 28<sup>th</sup> St. to 52<sup>nd</sup> St. because 40<sup>th</sup> St. is the midpoint. The sum of  $28+29 \dots 51+52=1,000$ . So the answer is:

**28<sup>th</sup> St. to 52<sup>nd</sup> St.!!!!!!!**