

1. Write your solutions on separate pieces of paper.
2. Write your name, your address, name of your school, and the school teacher at the top of each piece of paper you turn in.
3. When solving a problem explain your solution (even if you can only explain part of it, or have only part of a solution). Answers without explanations will receive no credit.

## MANHATTAN MATHEMATICAL OLYMPIAD 2008

### Grades 7-8

1. Heights of the acute triangle  $ABC$  intersect at the point  $O$ . It is known that  $OC = AB$ . Find the angle  $ACB$ .
2. Prove that if  $p$  and  $q$  are prime numbers which are greater than 3 then  $p^2 - q^2$  is divisible by 24.
3. What is the angle between the hands of a clock when it shows 9 : 20 ?
4. Prove that there exists a whole number divisible by  $5^{1000}$  which does not contain zeros among its digits.