

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 2007

Grades 7-8

1. Suppose that we know that for all integer numbers x the value of $ax^2 + bx + c$ is also integer. Can we conclude that the numbers a, b, c are integers?
2. Let x, y be integer numbers such that $3x + 7y$ is divisible by 19. Prove that $43x + 75y$ is also divisible by 19.
3. What is the biggest power of 2 which divides the product of 2007 consecutive numbers $2008 \cdot 2009 \cdot 2010 \dots \cdot 4014$?
4. It is easy to show that the sum of five acute angles of a regular star is equal to 180 degrees. Prove that the sum of five angles of an irregular star is also 180 degrees.

