MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 5 – FEBRUARY 2007
ROUND 2 ARITHMETIC / NUMBER THEORY

ANSWERS

A) (_____ , _____)

B) _____

C) _____

A) Let A be the smallest positive integer value for which $B = \frac{7A+1}{13}$ is also an integer. Find the ordered pair (A, B).

B) The sequences of positive integers generated by $7n + 2$ and $11n + 4$ have exactly one two-digit integer in common. What is the largest three-digit integer that they have in common?

C) The product of the first 2007 positive prime numbers is divisible by several 3-digit positive integers of the form $AAA_{(10)}$. Find the sum of all 3-digit positive integers of this form.
Note: 1 is not considered a prime number.