

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2012
ROUND 2 ARITHMETIC/NUMBER THEORY**

ANSWERS

A) _____

B) _____

C) _____

A) Compute the absolute value of the cube of the difference between the unit digits of 2^{71} and 3^{44} .

B) In a certain positive integer base b , $314_{(b)}$ is twice $132_{(b)}$. Compute b .

C) Determine the 117^{th} natural number that is divisible by 2 or 3, but not divisible by either 4 or 6.