

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2009
ROUND 4 ALG 2: LOG & EXPONENTIAL FUNCTIONS

******* NO CALCULATORS IN THIS ROUND *******

ANSWERS

A) _____

B) _____

C) $x =$ _____

A) Compute $\log_9 \left(1 + \frac{\sqrt{6}}{3} \right) + \log_9 \left(1 - \frac{\sqrt{6}}{3} \right)$

B) Compute all real values of x for which $\log_4 x^3 - 2 \log_{16} x + \log_{64} x^6 = 3$
Any radicals in your answer must have the smallest possible index.

C) Solve for x over the reals. $\frac{2^x - 2^{-x}}{2} = -1.875$