

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2012
ROUND 4 ALG 2: LOG & EXPONENTIAL FUNCTIONS

ANSWERS

A) _____

B) _____

C) (_____ , _____ , _____)

A) Compute the real value(s) of x for which $8^x = \sqrt[3]{\frac{2}{4^x}}$.

B) The real number a is the x -intercept of the function $f(x) = -3 + 4\log_{16} x$.

Compute $\left(\frac{\log_2 a^8}{\log_4 a^2} \right)^{\frac{1}{3}}$.

C) Given: $y_1 = 2(4^x)$, $y_2 = \frac{8^{x+2}}{4}$

For $x = a \log_2 b + c$, where a , b and c are integers and b is as small as possible, $y_2 = 81y_1$.

Compute the ordered triple (a, b, c) .