MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2013
ROUND 4 ALG 2: LOG & EXPONENTIAL FUNCTIONS

ANSWERS

A) _____

B) x = _____

C) _____

A) Given: For positive integers x and y, $x^y = y^x = 16$

Compute <u>all</u> possible values of $\dfrac{\log_x y + \log_y x}{x - y}$.

B) Given: $b > 0$ $(b \neq 1)$ and $x > 0$

Solve for x in terms of b. $\log_b x - \log_{b^3} x + \log_b \sqrt[5]{x} = 4$

C) Given: $f(x) = 2^x - 2^{-x}$

If $f(A) = 8$ and $f(B) = 4$ for $A > 0$ and $B > 0$, compute $2^A - 2^B$.