

MASSACHUSETTS MATHEMATICS LEAGUE

DECEMBER 2004

ROUND 4 ALG 2: LOGS & EXPONENTIAL FUNCTIONS

***** NO CALCULATORS ON THIS ROUND *****

ANSWERS

A) _____

B) _____

C) _____

A) Find all real solutions for: $\log_2 x + \log_2 (x - 6) = 4$

B) Solve for x: $8^{\frac{2\log_4 3}{3}} - e^{\ln 5} = x^2 - 7^{(\log_7 3 + \log_7 x)}$

C) The graph of the exponential function $f(x) = a b^x$ passes through the points $(1, \frac{1}{2})$ and $(3, \frac{3}{8})$. Find the exact value of $a+b$