MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 6 – MARCH 2007
ROUND 2 ALG 1: EXPONENTS AND RADICALS

ANSWERS

A) _____

B) x = _____ , y = _____

C) a = _____ , b = _____ , c = _____

A) The variables a, b, c and d have distinct values of 1, -2, 3 and -4, but not necessarily in that order. Determine the maximum possible value of the expression $a^b - c^d$.

B) Solve for x and y, if $\frac{4^{2x}}{2^{2y}} = \frac{8^{8x}}{64^{y}}$ and $\left(\frac{1}{3}\right)^{y-x} = 81$.

C) $\sqrt{48 - 24\sqrt{3}}$ in a simplified form can be written as $a + b\sqrt{c}$ where a, b and c are integers and c is square-free, i.e. contains no factors which are perfect squares (other than 1). Find a, b and c.