MASSACHUSETTS MATHEMATICS LEAGUE
MARCH 2005
ROUND 1: ALGEBRA 2 SIMULTANEOUS EQUATIONS & DETERMINANTS
ANSWERS

A)_____

B)_____

C)_____

A) If (a, b, c) is the solution to the following system, evaluate abc

$$\begin{cases} a + 2b + 3c = 3 \\ 3b + 2c = 7 \\ 3b + 4c = 17 \end{cases}$$

B) For real numbers s and t, $s + t = 17$ while $\sqrt{s}\sqrt{t} = 7$. In simplified radical form $s = a \pm b\sqrt{c}$ with $b>0$. Find the value of $c + b + a$.

C) For what value(s) of the constant c will the following system have no real solutions for (x, y, z)?

$$\begin{cases} x + 2y + 3z = 5 \\ 2x + cz = y + 1 \\ cx + 6z = 8 + 2y \end{cases}$$