

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 6 – MARCH 2013
ROUND 1 ALG 2: SIMULTANEOUS EQUATIONS AND DETERMINANTS

ANSWERS

A) _____

B) (_____ , _____)

C) _____

***** NO CALCULATORS IN THIS ROUND *****

- A) Determine the unique value of k for which the following system has an infinite number of solutions.

$$\begin{cases} y = 2x - 3 \\ \frac{x}{2} - \frac{y}{4} = k \end{cases}$$

- B) The system of equations $\begin{cases} y = 2x + A + B \\ y - A = \frac{1}{2}(x - B) \end{cases}$ intersect at $(-2, 1)$.

Compute (A, B) .

- C) Compute all values of k for which $\begin{vmatrix} 3k-5 & 3 \\ 4 & k-2 \end{vmatrix} = \begin{vmatrix} 1 & k-1 & -2 \\ 1 & 2 & -1 \\ 7-2k & -3 & 0 \end{vmatrix}$.