

**MASSACHUSETTS MATHEMATICS LEAGUE**  
**CONTEST 6 - MARCH 2016**  
**ROUND 1 ALG 2: SIMULTANEOUS EQUATIONS AND DETERMINANTS**

**ANSWERS**

A) ( \_\_\_\_\_ , \_\_\_\_\_ )

B) \_\_\_\_\_

C) \_\_\_\_\_

A) Given: 
$$\begin{cases} 3x - 4y = 10 \\ \frac{x}{2} + ky = c \end{cases}$$

If  $k = a$  and  $c \neq b$ , these equations are inconsistent, i.e. there is no solution.  
Compute the ordered pair  $(a, b)$ .

B)  $\begin{bmatrix} A+B & B+k \\ C+k+3 & C+D \end{bmatrix}$  is the 2 x 2 identity matrix.

Compute  $(A - B) + (C - D)$ .

C) If each of 4 numbers is added to the average of the other three,  
the sums produced are: 26, 30, 38 and 42. Determine the four numbers.