

**MASSACHUSETTS MATHEMATICS LEAGUE  
CONTEST 4 - JANUARY 2015  
ROUND 4 ALG 2: QUADRATIC EQUATIONS**

**ANSWERS**

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

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

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

A) Given:  $x = y^2 - 10y + 3$

The minimum value of  $x$ , call it  $m$ , occurs for  $y = k$ .

Compute the ordered pair  $(m, k)$ .

B) For what values of the constant  $m$  does the following quadratic equation have roots that are real and unequal?

$$2m^2x^2 - 7mx = -3m(1+x)$$

C) Find all values of the constant  $k$  for which the equation  $(k+7)x^2 - kx + 9 = 0$  has exactly one solution.