

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 6 – MARCH 2011
ROUND 1 ALG 2: SIMULTANEOUS EQUATIONS AND DETERMINANTS

ANSWERS

A) _____

B) (_____ , _____)

C) (_____ , _____ , _____)

******* NO CALCULATORS ON THIS ROUND *******

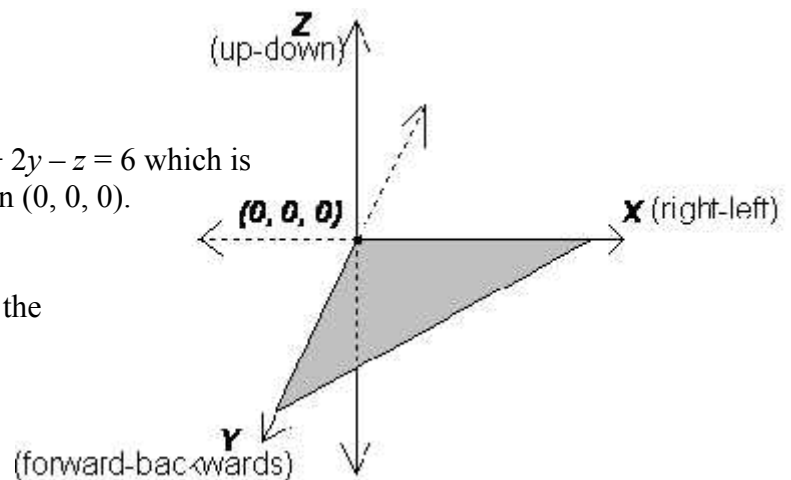
A) Find all ordered pairs (x, y) which satisfy the system $\begin{cases} 5x - 11y = 96 \\ x^2 - y^2 = 0 \end{cases}$.

B) Given: the matrix $\begin{bmatrix} x & 2 \\ x+1 & 10-x \end{bmatrix}$

Compute the ordered pair (x, M) , where x is the value for which the determinant of this matrix attains its maximum value .

C) Let $P(a, b, c)$ be the point in the plane $3x + 2y - z = 6$ which is also in the xy -plane and closest to the origin $(0, 0, 0)$. Determine the ordered triple (a, b, c) .

Note: The xy -plane is the plane containing the shaded region.



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