

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 – JANUARY 2010
ROUND 1 ANALYTIC GEOMETRY: ANYTHING**

ANSWERS

A) _____

B) _____

C) (_____ , _____)

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

A) Determine the coordinates (x, y) of all possible intersection points with the x - and y -axes of $x^2 - (y - 1)^2 = 1$.

B) Compute the diameter of a circle concentric with $5x^2 + 5y^2 + 15x = 21$ and tangent to $2x + 4y + 13 = 0$.

C) The points $P(6, 5)$, $Q(11, 7)$ and R lie on a parabola whose vertex is at $V(2, 1)$.
The axis of symmetry is parallel to one of the coordinate axes.
The focus of the parabola lies on \overline{QR} .
Compute the (x, y) coordinates of the point R .