MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2016
ROUND 1 ANALYTIC GEOMETRY: ANYTHING

ANSWERS

A) _____

B) (_____ , _____)

C) k = _____

A) An equation of the axis of symmetry of the parabola $y=(x+3)(x-h)$ is $x=8$. Compute the value of *h*.

B) The area of the region between $x^2+y^2=16$ and $|x|+|y|=4$ can be expressed as $A(\pi-B)$, where $B>0$. Determine the ordered pair of <u>integers</u> (*A*, *B*).

C) The line ℓ defined by the equation $3x + 4y = 24$ passes through one of the endpoints of the major axis and one of the endpoints of minor axis of the ellipse defined by $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, where $a>b$. Compute the *y*-intercept *k* of the line perpendicular to ℓ and passing through the focus of the ellipse that lies on the positive *x*-axis.