

**MASSACHUSETTS MATHEMATICS LEAGUE  
CONTEST 4 – JANUARY 2015  
ROUND 1 ANALYTIC GEOMETRY: ANYTHING**

**ANSWERS**

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

B)  $(x - \square)^2 + (y - \square)^2 = \square$

C) ( \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ )

A) An ellipse has a focus at  $(4, -7)$  and vertices at  $(4, \pm 13)$ .

Its equation is written in the form  $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ .

Determine the ordered quadruple  $(h, k, a^2, b^2)$ .

B) Find the equation of the circle containing the points  $P(-5, 2)$ ,  $Q(-3, 4)$  and  $R(1, 2)$ .

Give your answer in  $(x-h)^2 + (y-k)^2 = r^2$  form.

C) The equations of the asymptotes of the conic defined by  $9x^2 - 6y^2 + 18x + 18 = 0$  are written in the form  $y = \pm m(x-h) + k$ . Compute the ordered triple  $(m, h, k)$ , where  $m > 0$ .