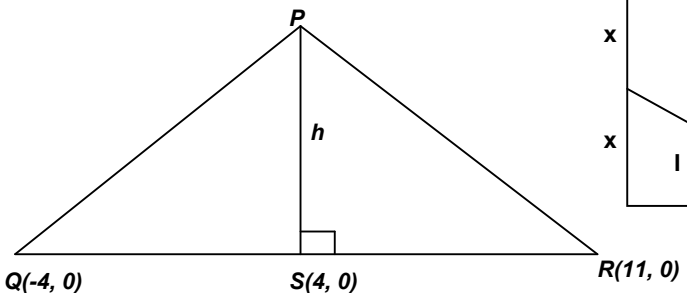
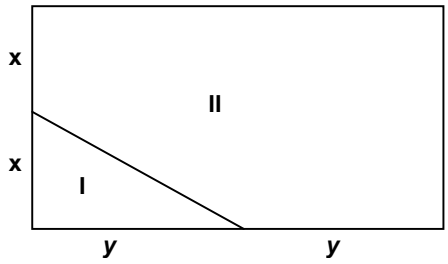
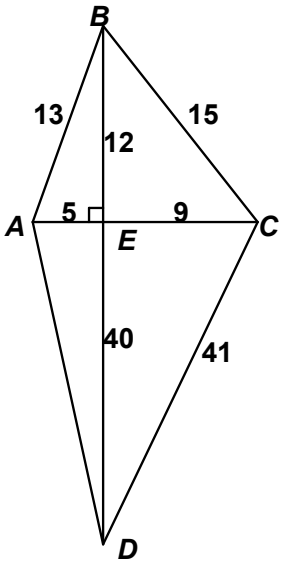
MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 2 – NOVEMBER 2009 SOLUTION KEY

Round 3







A) $QR = 15$, $QS = 8$ and $SR = 7$

$\frac{1}{2}(15)h = 45$ → $h = 6$

ΔPSR has the smaller area, $\frac{1}{2} \cdot 7 \cdot 6 =$ **21**

B) Area(I) = $\frac{1}{2}xy$, Area(II) = $4xy - \frac{1}{2}xy = \frac{7}{2}xy$

Thus, regardless of the dimensions of the rectangle, region II has an area 7/8 that of the rectangle → $\frac{7}{8}(500) =$ **437.5** or $\left(\frac{\mathbf{875}}{\mathbf{2}}\right)$

C) Noting special right triangles 5 - 12 - 13, 3(3 - 4 - 5) and 9 – 40 - 41, the problem is almost done.

$AD = \sqrt{1625} = 5\sqrt{65}$

65 is only slightly bigger than the perfect square 64.

$8.1^2 = 65.61$ → $\sqrt{65} < 8.1$ → $5\sqrt{65} < 40.5$

Thus, to the nearest integer, the perimeter of ΔADE is **85**.