MASSACHUSETTS MATHEMATICS LEAGUE
OCTOBER 2004
ROUND 2 PYTHAGOREAN RELATIONS

ANSWERS

A)_____

B)_____meters

C)_____

A) **The diagonals of a rhombus have lengths of 16 and 30. Find the perimeter of the rhombus.**

B) **A park has the shape of a right trapezoid ABCD with $\overline{AD} \perp \overline{AB}$ and $\overline{AD} \perp \overline{DC}$. AB=900 meters, AD=1200 meters, and BC=2000 meters. Two surveyors start at A and walk the perimeter at the same speed, one clockwise and the other counterclockwise. When they meet, how far are they from the nearest vertex?**

C) **An altitude $\overline{CD}$ is drawn to hypotenuse $\overline{AB}$ of a right triangle with legs of 3 and 4. $\overline{AD}$, the shorter segment on the hypotenuse, is rotated 90° about the point D. The distance between B and the new location of A is $\frac{a}{b}\sqrt{c}$ where a, b, and c are integers, the radical is simplified, and a and b are relatively prime. Find a+b+c.**