MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2012
ROUND 5 GEOMETRY: SIMILARITY OF POLYGONS

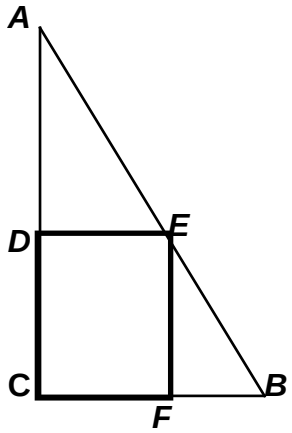
ANSWERS

A) _____

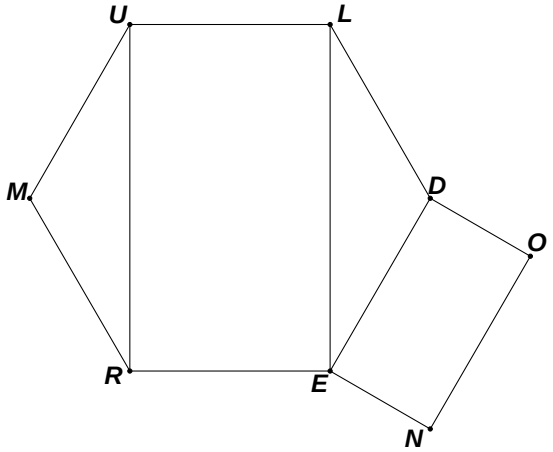
B) _____

C) _____

A) *DEFC* is a rectangle with vertices on the sides of right triangle *ABC* as indicated in the diagram at the right. If (*DE*, *DC*, *DA*) = (2, 3, *k*), find a <u>simplified</u> expression for *FB* in terms of *k*.



B) Given: Regular hexagon *MULDER* with *MR* = 2.
DONE is a rectangle, where *DO* < *DE*.
DONE is similar to, but not congruent to, *RULE*.
Compute *DO*.



C) In ΔABC, $AB = 9$, $BC = 15$, $\overline{BA} \perp \overline{CA}$, D is the <u>midpoint</u> of $\overline{AB}$ and E lies on $\overline{AC}$. The triangle with vertices A, D and E is similar to ΔABC, in some order. The length of $\overline{AE}$ can be expressed as a simplified ratio of positive integers, $\frac{a}{b}$.

Compute all possible <u>sums</u> $a + b$.