MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2017
ROUND 5 GEOMETRY: SIMILARITY OF POLYGONS

ANSWERS

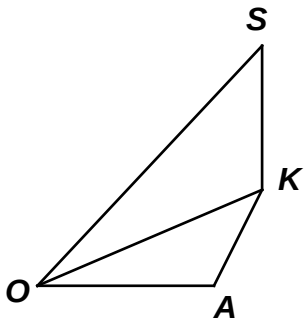
A) _____

B) _____

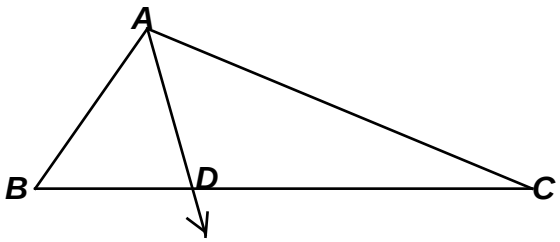
C) _____

Diagrams are not necessarily drawn to scale.

A) Given: $\angle SOK \cong \angle KOA$, $OS = 9$, $OK = 6$, $OA = 4$ and the perimeter of quadrilateral $SOAK$ is 21.
Compute KS.



B) In ΔABC, $AB = x - 2$, $AC = 2x$, and $BC = 2x + 1$
Point D is on $\overline{BC}$ such that $\overrightarrow{AD}$ bisects $\angle BAC$.
Equilateral triangles are constructed on $\overline{BD}$ and $\overline{DC}$.
If the perimeter of ΔABC is 49, the simplified ratio of the area of the larger equilateral triangle to the area of the smaller equilateral triangle is $K : J$. Compute $K + J$.



C) Triangle T has an area of 1 square unit, and it is similar to a right triangle with sides of length 3, 4, and 5. T is inscribed in a circle. Compute the area of this circle.