MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 2 - NOVEMBER 2006
ROUND 3 PLANE GEOMETRY: AREAS OF RECTILINEAR FIGURES

ANSWERS

A) _____

B) _____ : _____

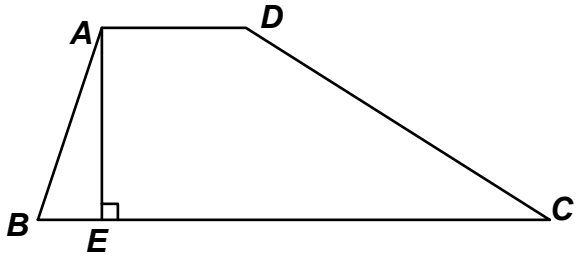
C) _____

A) Find the exact area of trapezoid $ABCD$, with bases $\overline{AD}$ and $\overline{BC}$, given:

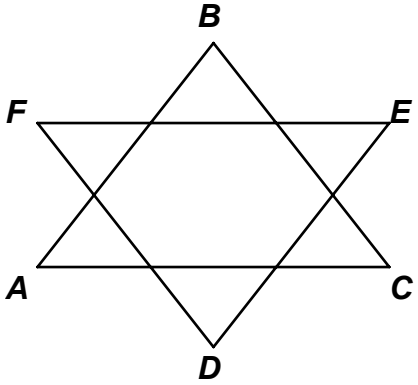
$AB = 25$, $BC = DC = 40$, $AE = 24$

$AD < BC$ and E is between B and C

The diagram is not necessarily drawn to scale.



B) A six-pointed star is formed by taking equilateral ΔABC, flipping it over a horizontal line to form ΔDEF, and placing it on top of the ΔABC so that all of its sides are trisected by the intersection points. Express (in simplest form) the ratio of the area of the entire star to the area of the original ΔABC.



C) The area of ΔABC is 6 units^2. The 30° angle is bisected by $\overline{AD}$. Determine the exact area of ΔADC.