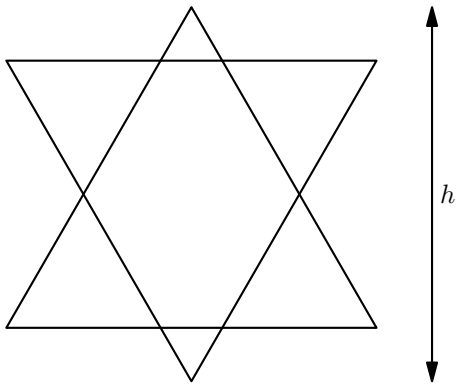
Name: _____ **Team:** _____

Directions: You have 30 minutes to complete these 3 problems. All answers must be written in accordance with the conventions on the Conventions page on the MMM website. Write all of your answers on the this sheet. You may only use scratch paper provided by the MMM. No calculators allowed. Please remember to check your work!

1. Two congruent equilateral triangles overlap as shown below. If the side length of each triangle is 12 and the height h marked is $7\sqrt{3}$, compute the area of the region of overlap.

1. _____



2. Square $ABCD$ and $AEFG$ have the same side length and are oriented in the same direction. (In other words, $ABCD$ and $AEFG$ are either both clockwise or counterclockwise.) If the length of $ED = 20\sqrt{13}$ and $BG = 20\sqrt{14}$. Compute the side length of each square.

2. _____

3. Points C and D are chosen on the same side of diameter AB of circle O such that $BC < BD$. If $AD = DC = 20$ and $CB = 7$, what is the length of the diameter?

3. _____