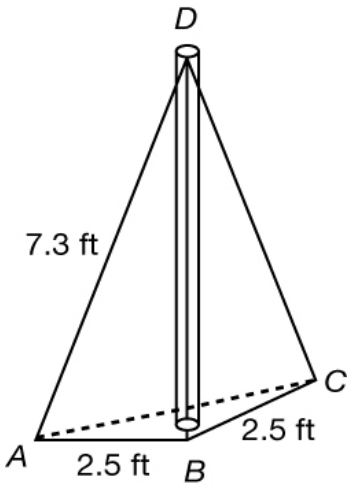
Name _____ Date _____ Class_____

Performance Task **7**

Fountains

Fountain designs often incorporate geometric elements. These elements provide balance and beauty for the beholder.

1. This diagram shows a fountain rising through a pyramid in which $\overline{DB}$ is perpendicular to the plane containing points A, B, and C.



   a. Explain how you know that ΔADB and ΔCDB are congruent.

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   b. Find CD. Justify your reasoning.

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   c. What type of triangle is ΔABC? Justify your response.

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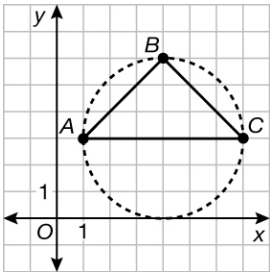
2. This diagram shows three points A, B, and C on a circle. A fountain is to located at the point where the perpendicular bisectors of $\overline{AC}$, $\overline{BC}$ and $\overline{AB}$ intersect.



   a. Find an equation for the perpendicular bisector of $\overline{AC}$. Explain your reasoning.

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   b. Find an equation for the perpendicular bisector of $\overline{AB}$. Show your work.

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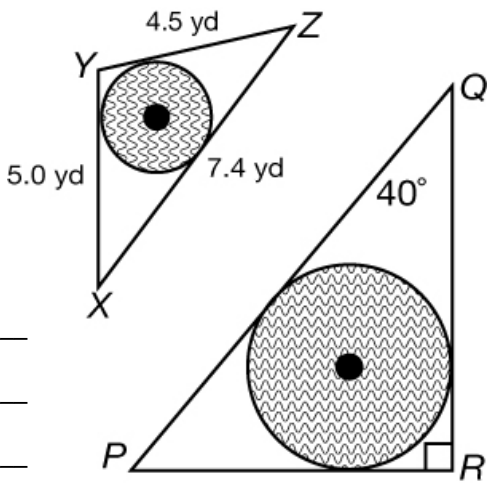
   c. Find the coordinates of the point where the perpendicular bisectors of $\overline{AB}$ and $\overline{AC}$ intersect. Show your work.

   _____

3. There are two memorial fountains in the centers of two circles each nesting snugly inside the triangular parks shown here.



   a. List the three angle measures and three sides in ΔPQR in order from least measure to greatest measure. Justify your reasoning.

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   b. List the three angle measures of ΔXYZ in order from least to greatest. Justify your reasoning.

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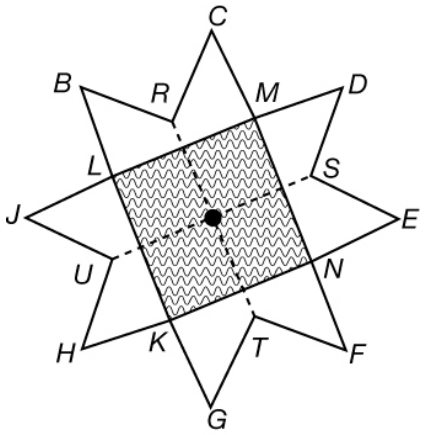
4. This diagram shows an eight-point star with a fountain centered in square *KLMN*. In the diagram $LM = 4.8$, $BL = 3.0$, and each dashed line segment is 1.0 units long.



   a. Find the area of polygon *LBRCM*. Justify your reasoning.

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   b. Find the total area of the eight-point star.

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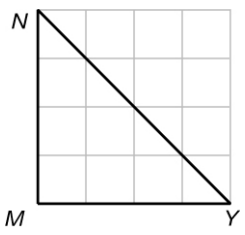
5. This diagram shows ΔMNY. A fountain is to be built where the angle bisector of $\angle M$ intersects $\overline{NY}$, point *X*. How do ΔMXY and ΔMXN compare? Use the diagram to explain your response.



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