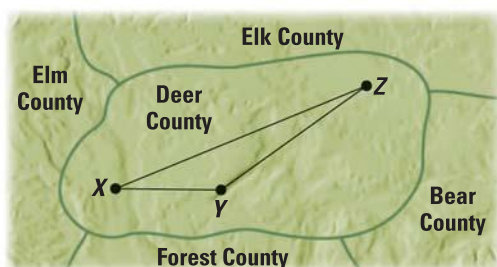


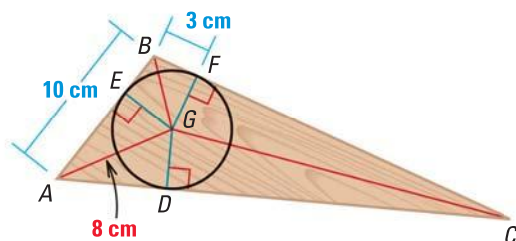


Lessons 5.1–5.3

1. **SHORT RESPONSE** A committee has decided to build a park in Deer County. The committee agreed that the park should be equidistant from the three largest cities in the county, which are labeled X, Y, and Z in the diagram. *Explain* why this may not be the best place to build the park. Use a sketch to support your answer.

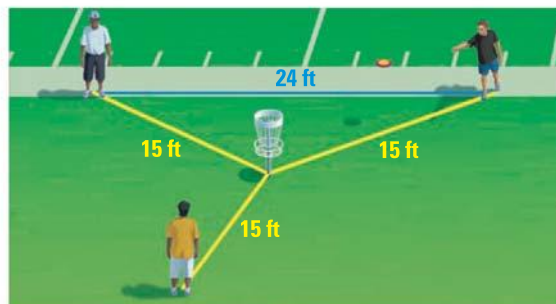


2. **EXTENDED RESPONSE** A woodworker is trying to cut as large a wheel as possible from a triangular scrap of wood. The wheel just touches each side of the triangle as shown below.

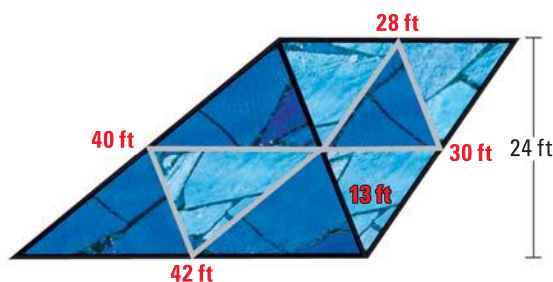


- Which point of concurrency is the woodworker using for the center of the circle? What type of special segment are \overline{BG} , \overline{CG} , and \overline{AG} ?
 - Which postulate or theorem can you use to prove that $\triangle BGF \cong \triangle BGE$?
 - Find the radius of the wheel to the nearest tenth of a centimeter. *Explain* your reasoning.
3. **SHORT RESPONSE** Graph $\triangle GHJ$ with vertices $G(2, 2)$, $H(6, 8)$, and $J(10, 4)$ and draw its midsegments. Each midsegment is contained in a line. Which of those lines has the greatest y-intercept? Write the equation of that line. *Justify* your answer.

4. **GRIDDED ANSWER** Three friends are practicing disc golf, in which a flying disk is thrown into a set of targets. Each player is 15 feet from the target. Two players are 24 feet from each other along one edge of the nearby football field. How far is the target from that edge of the football field?



5. **MULTI-STEP PROBLEM** An artist created a large floor mosaic consisting of eight triangular sections. The grey segments are the midsegments of the two black triangles.



- The gray and black edging was created using special narrow tiles. What is the total length of all the edging used?
 - What is the total area of the mosaic?
6. **OPEN-ENDED** If possible, draw a triangle whose incenter and circumcenter are the same point. *Describe* this triangle as specifically as possible.
7. **SHORT RESPONSE** Points S, T, and U are the midpoints of the sides of $\triangle PQR$. Which angles are congruent to $\angle QST$? *Justify* your answer.

