

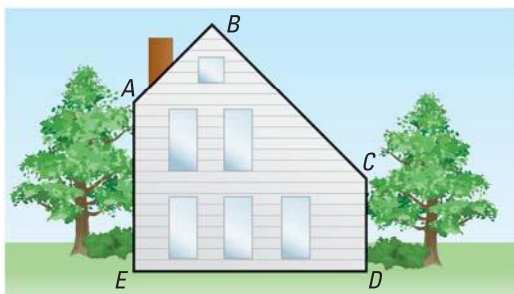


Lessons 8.1–8.3

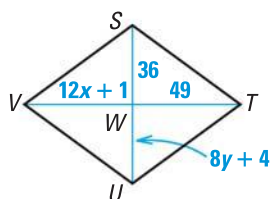
1. **MULTI-STEP PROBLEM** The shape of Iowa can be approximated by a polygon, as shown.



- How many sides does the polygon have? Classify the polygon.
 - What is the sum of the measures of the interior angles of the polygon?
 - What is the sum of the measures of the exterior angles of the polygon?
2. **SHORT RESPONSE** A graphic designer is creating an electronic image of a house. In the drawing, $\angle B$, $\angle D$, and $\angle E$ are right angles, and $\angle A \cong \angle C$. Explain how to find $m\angle A$ and $m\angle C$.

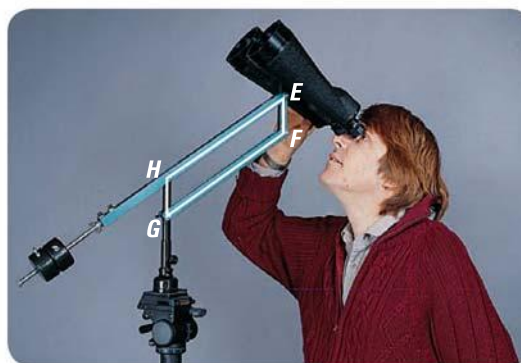


3. **SHORT RESPONSE** Quadrilateral $STUV$ shown below is a parallelogram. Find the values of x and y . Explain your reasoning.



4. **GRIDDED ANSWER** A convex decagon has interior angles with measures 157° , 128° , 115° , 162° , 169° , 131° , 155° , 168° , x° , and $2x^\circ$. Find the value of x .

5. **SHORT RESPONSE** The measure of an angle of a parallelogram is 12 degrees less than 3 times the measure of an adjacent angle. Explain how to find the measures of all the interior angles of the parallelogram.
6. **EXTENDED RESPONSE** A stand to hold binoculars in place uses a quadrilateral in its design. Quadrilateral $EFGH$ shown below changes shape as the binoculars are moved. In the photograph, \overline{EF} and \overline{GH} are congruent and parallel.



- Explain why \overline{EF} and \overline{GH} remain parallel as the shape of $EFGH$ changes. Explain why \overline{EH} and \overline{FG} remain parallel.
 - As $EFGH$ changes shape, $m\angle E$ changes from 55° to 50° . Describe how $m\angle F$, $m\angle G$, and $m\angle H$ will change. Explain.
7. **EXTENDED RESPONSE** The vertices of quadrilateral $MNPQ$ are $M(-8, 1)$, $N(3, 4)$, $P(7, -1)$, and $Q(-4, -4)$.
- Use what you know about slopes of lines to prove that $MNPQ$ is a parallelogram. Explain your reasoning.
 - Use the Distance Formula to show that $MNPQ$ is a parallelogram. Explain.
8. **EXTENDED RESPONSE** In $\square ABCD$, $\overline{BX} \perp \overline{AC}$, $\overline{DY} \perp \overline{AC}$. Show that $XYBD$ is a parallelogram.

