Explorations

These exploratory exercises can be done using a computer with a program that draws and measures geometric figures.

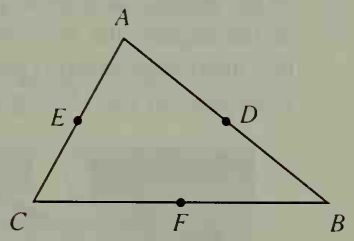
Draw any $\triangle ABC$. Label the midpoint of $\overline{AB}$ as D, of $\overline{AC}$ as E, and of $\overline{BC}$ as F.

Form a quadrilateral ($ABFE$, $BCED$, or $CADF$) by using two midpoints and two vertices.

What kind of quadrilateral is each of $ABFE$, $BCED$, and $CADF$? How do you know?

Form a quadrilateral ($ADFE$, $BFED$, or $CEDF$) by using three midpoints and a vertex.

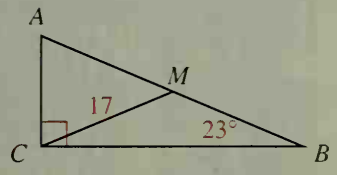
What kind of quadrilateral is each of $ADFE$, $BFED$, and $CEDF$? How do you know?



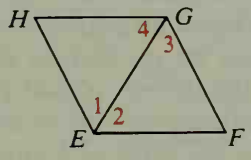
Self-Test 2

Quad. *WXYZ* must be a special figure to meet the conditions stated. Write the best name for that special quadrilateral.

1. $\overline{WX} \cong \overline{YZ}$ and $\overline{WX} \parallel \overline{YZ}$
2. $\overline{WX} \parallel \overline{YZ}$ and $\overline{WX} \ncong \overline{YZ}$
3. $\overline{WX} \cong \overline{YZ}$, $\overline{XY} \cong \overline{ZW}$, and diag. $\overline{WY} \cong$ diag. $\overline{XZ}$
4. Diagonals $\overline{WY}$ and $\overline{XZ}$ are congruent and are perpendicular bisectors of each other.
5. An isosceles trapezoid has sides of lengths 5, 8, 5, and 14. Find the length of the median.
6. M is the midpoint of hypotenuse $\overline{AB}$. Find AM and $m\angle ACM$.



7. Given: $\angle 1 \cong \angle 2 \cong \angle 3 \cong \angle 4$
   Prove: $EFGH$ is a rhombus.



8. $PQRS$ is a $\square$.
   a. If X is the midpoint of $\overline{PQ}$ and Y is the midpoint of $\overline{SR}$, what special kind of quadrilateral is $XQRY$?
   b. Prove your answer to part (a).
   c. Draw a line through O intersecting $\overline{PQ}$ at J and $\overline{SR}$ at K. If J and K are not midpoints, what special kind of quadrilateral is $JQRK$?