

## Explorations

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

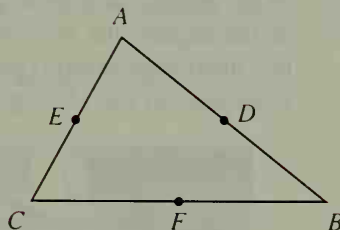
Draw any  $\triangle ABC$ . Label the midpoint of  $\overline{AB}$  as  $D$ , of  $\overline{AC}$  as  $E$ , and of  $\overline{BC}$  as  $F$ .

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.

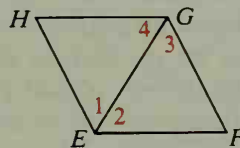
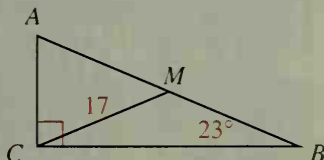
What kind of quadrilateral is each of  $ADFE$ ,  $BFED$ , and  $CEDF$ ? How do you know?



## Self-Test 2

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

- $\overline{WX} \cong \overline{YZ}$  and  $\overline{WX} \parallel \overline{YZ}$
- $\overline{WX} \parallel \overline{YZ}$  and  $\overline{WX} \not\cong \overline{YZ}$
- $\overline{WX} \cong \overline{YZ}$ ,  $\overline{XY} \cong \overline{ZW}$ , and  $\text{diag. } \overline{WY} \cong \text{diag. } \overline{XZ}$
- Diagonals  $\overline{WY}$  and  $\overline{XZ}$  are congruent and are perpendicular bisectors of each other.
- An isosceles trapezoid has sides of lengths 5, 8, 5, and 14. Find the length of the median.
- $M$  is the midpoint of hypotenuse  $\overline{AB}$ . Find  $AM$  and  $m\angle ACM$ .
- Given:  $\angle 1 \cong \angle 2 \cong \angle 3 \cong \angle 4$   
Prove:  $EFGH$  is a rhombus.



- $PQRS$  is a  $\square$ .
  - If  $X$  is the midpoint of  $\overline{PQ}$  and  $Y$  is the midpoint of  $\overline{SR}$ , what special kind of quadrilateral is  $XQRY$ ?
  - Prove your answer to part (a).
  - 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  $JQRK$ ?

