



Explore the Midpoint Quadrilateral
of a Quadrilateral

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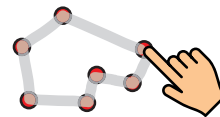
Prerequisites and Objectives

- ▶ Students know special quadrilaterals such as rectangle, square, trapezoid, kite, rhombus, and parallelogram.
- ▶ Students construct the midpoints of the sides of a quadrilateral and investigate the midpoint quadrilateral.
- ▶ Students explain why this quadrilateral is a parallelogram.

sketchometry Instructions

Students should know

- ▶ how to construct a quadrilateral/polygon,



- ▶ how to construct the midpoint of a line segment,



- ▶ how to show grid lines and

 Properties >  Show Grid

- ▶ how to snap to the grid.

 Properties >  Snap to grid

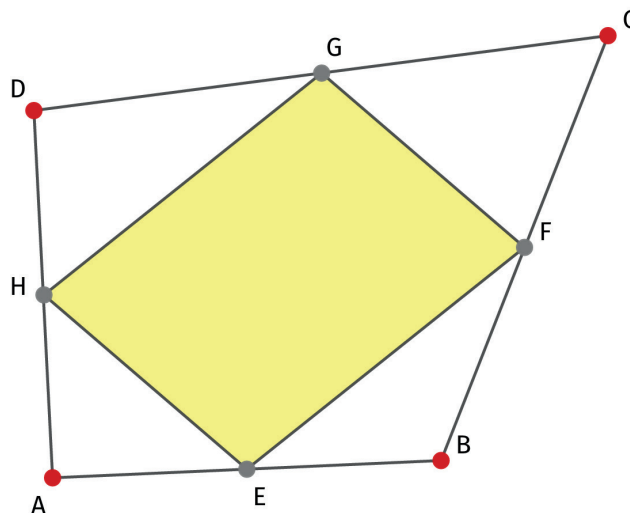
Further Explorations

- ▶ Students compare this result with the midpoint quadrilateral of a kite.
- ▶ Students investigate midpoint quadrilaterals of other special quadrilaterals.

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Construction

- ▶ Choose any four points and connect them to obtain a quadrilateral.
- ▶ Construct the midpoints E, F, G, and H of the sides of the quadrilateral.
- ▶ Draw the midpoint quadrilateral EFGH.



Exploration

- ▶ Drag any of the vertices A, B, C, and D and observe the midpoint quadrilateral EFGH. Describe its shape.
- ▶ Write down your observation in your study journal.
- ▶ Support your conjecture with a proof. Hint: Draw the diagonals of quadrilateral ABCD as auxiliary lines.
- ▶ Draw special types of quadrilaterals ABCD (square, rectangle, parallelogram, rhombus) by placing the vertices of these quadrilaterals on grid points. Describe what kind of midpoint quadrilaterals you get.
- ▶ Write your results in your study journal together with sketches and proofs.

