

Varignon's Theorem

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Theorem 3.7. (Varignon's Theorem) Let $ABCD$ be a quadrilateral. The midpoints of the four sides are vertices of a parallelogram.

Proof. Let $ABCD$ be a quadrilateral. Let E , F , G , and H be the vertices of a parallelogram. Then we connect AC , and we get triangle ABC . E is the midpoint of the side AB , F is the midpoint of the side BC . By the Proposition I.33, we know that EF is parallel to side AC . Similar argument goes for triangle ADC . Secondly, we connect BD , and we get triangle BCD . F is still a midpoint of the side BC and G is midpoint of the side CD . FG is parallel to the side BD . Similar argument goes for triangle ABD . By Proposition I.34, parallelogram's opposite sides and angles are equal to one another. Thus, $EFGH$ must be a parallelogram.

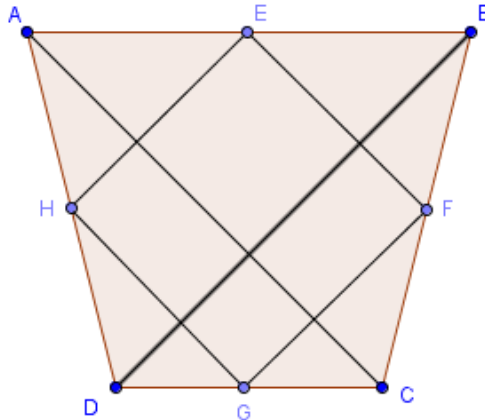


Figure 1: Quadrilateral

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