

## Watch. Practice. Understand. | Lesson 081

Proving a Quadrilateral is a Parallelogram (Big Idea Geometry Honors 8.3)

Watch the matching video: <https://www.youtube.com/watch?v=KCI0wnCipnc>

Practice focus: Quadrilateral properties and proof

Original extra practice matched to the listed lesson topic.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning and check units.

**01** The diagonals of a quadrilateral bisect each other. What special quadrilateral must it be?

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**02** A parallelogram has perpendicular diagonals. What more specific classification follows?

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**03** A parallelogram has congruent diagonals. What can be concluded?

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**04** A rhombus has diagonals 12 and 16. Find its side length.

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Practice focus: Polygons and quadrilaterals

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Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning and check units.

**05** Find the sum of the interior angles of a hexagon.

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**06** A regular polygon has exterior angle  $24^\circ$ . How many sides does it have?

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**07** A parallelogram has one angle  $70^\circ$ . Find all its angles.

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**08** A trapezoid has bases 8 and 14. Find its midsegment length.

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## Worked answers | Lesson 081

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**01** The diagonals of a quadrilateral bisect each other. What special quadrilateral must it be?

A parallelogram, by the converse of the diagonal-bisection property.

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**02** A parallelogram has perpendicular diagonals. What more specific classification follows?

It is a rhombus; perpendicular diagonals alone do not force right angles at the vertices.

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**03** A parallelogram has congruent diagonals. What can be concluded?

It is a rectangle. Congruent diagonals imply equal adjacent angles, which must then be right angles.

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**04** A rhombus has diagonals 12 and 16. Find its side length.

Half-diagonals 6 and 8 form perpendicular legs. Side =  $\sqrt{6^2 + 8^2} = 10$ .

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**05** Find the sum of the interior angles of a hexagon.

$$(6 - 2)180^\circ = 720^\circ.$$

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**06** A regular polygon has exterior angle  $24^\circ$ . How many sides does it have?

$$n = 360/24 = 15 \text{ sides.}$$

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**07** A parallelogram has one angle  $70^\circ$ . Find all its angles.

Opposite angles are equal; adjacent angles are supplementary. Angles:  $70^\circ$ ,  $110^\circ$ ,  $70^\circ$ ,  $110^\circ$ .

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**08** A trapezoid has bases 8 and 14. Find its midsegment length.

$$\text{Midsegment} = (8 + 14)/2 = 11.$$