

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

Lesson 081 | Geometry | Quadrilateral properties and proof • Polygons and quadrilaterals

<https://www.youtube.com/watch?v=KCI0wnCipnc>

Original practice aligned to the saved video title.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning.

01

Parallelogram ABCD has  $AB=2x+13$ ,  $CD=19$ , and angle  $A=80^\circ$ . Find  $x$  and the remaining angles, citing properties.

---

02

A regular 8-gon has side length 18. Find its perimeter, interior-angle sum, each exterior angle, and number of diagonals.

---

03

Parallelogram ABCD has  $AB=14x+11$ ,  $CD=109$ , and angle  $A=75^\circ$ . Find  $x$  and the remaining angles, citing properties.

---

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

Lesson 081 | Geometry | Quadrilateral properties and proof • Polygons and quadrilaterals

<https://www.youtube.com/watch?v=KCI0wnCipnc>

Original practice aligned to the saved video title.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Show your reasoning.

**04**

A regular 9-gon has side length 96. Find its perimeter, interior-angle sum, each exterior angle, and number of diagonals.

---

**05**

Parallelogram ABCD has  $AB=12x+3$ ,  $CD=99$ , and angle  $A=70^\circ$ . Find  $x$  and the remaining angles, citing properties.

---

**06**

A regular 5-gon has side length 27. Find its perimeter, interior-angle sum, each exterior angle, and number of diagonals.

---

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

Lesson 081 | Geometry | Quadrilateral properties and proof • Polygons and quadrilaterals

<https://www.youtube.com/watch?v=KCI0wnCipnc>

Original practice aligned to the saved video title.

01

Parallelogram ABCD has  $AB=2x+13$ ,  $CD=19$ , and angle  $A=80^\circ$ . Find  $x$  and the remaining angles, citing properties.

Opposite sides equal:  $2x+13=19$ , so  $x=3$ . Opposite angles equal:  $C=80^\circ$ . Consecutive angles supplementary:  $B=D=100^\circ$ .

02

A regular 8-gon has side length 18. Find its perimeter, interior-angle sum, each exterior angle, and number of diagonals.

Perimeter 144; angle sum  $(8-2)180^\circ=1080^\circ$ ; each exterior angle  $360/8=45^\circ$ . Diagonals  $8(8-3)/2=20$ .

03

Parallelogram ABCD has  $AB=14x+11$ ,  $CD=109$ , and angle  $A=75^\circ$ . Find  $x$  and the remaining angles, citing properties.

Opposite sides equal:  $14x+11=109$ , so  $x=7$ . Opposite angles equal:  $C=75^\circ$ . Consecutive angles supplementary:  $B=D=105^\circ$ .

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

Lesson 081 | Geometry | Quadrilateral properties and proof • Polygons and quadrilaterals

<https://www.youtube.com/watch?v=KCI0wnCipnc>

Original practice aligned to the saved video title.

**04**

A regular 9-gon has side length 96. Find its perimeter, interior-angle sum, each exterior angle, and number of diagonals.

Perimeter 864; angle sum  $(9-2)180^\circ=1260^\circ$ ; each exterior angle  $360/9=40^\circ$ . Diagonals  $9(9-3)/2=27$ .

**05**

Parallelogram ABCD has  $AB=12x+3$ ,  $CD=99$ , and angle  $A=70^\circ$ . Find  $x$  and the remaining angles, citing properties.

Opposite sides equal:  $12x+3=99$ , so  $x=8$ . Opposite angles equal:  $C=70^\circ$ . Consecutive angles supplementary:  $B=D=110^\circ$ .

**06**

A regular 5-gon has side length 27. Find its perimeter, interior-angle sum, each exterior angle, and number of diagonals.

Perimeter 135; angle sum  $(5-2)180^\circ=540^\circ$ ; each exterior angle  $360/5=72^\circ$ . Diagonals  $5(5-3)/2=5$ .