

Parallelogram Diagonal Conjectures

Recall we formed several conjectures about the diagonals of parallelograms:

1. In a parallelogram, the diagonals bisect each other.
2. In a rectangle, the diagonals are congruent.
3. In a rhombus, the diagonals are perpendicular.

Another way that mathematicians sometimes make conjectures is to modify the conditions or the statement in some way—for example, wondering if the converse of a statement might also be true.

What would the converses of the statements above be?

4 (converse of #1). If a quadrilateral has diagonals that _____ then it is a _____.

5 (converse of #2). If a parallelogram has diagonals that _____ then it is a _____.

6 (converse of #3) If a parallelogram has diagonals that _____ then it is a _____.

Group Portion of Exam 2:

Ten points of your Exam 2 grade will be a proof of one of the conjectures from the list above. Your instructor will assign the specific conjecture and group members.

Note: In #5 and #6, it is not sufficient to claim “If a **quadrilateral** has diagonals that”

These would not be true claims, so would be impossible to prove ☺ !

In fact, we have discussed particular shapes that would be counter-examples to the claims if they only required a quadrilateral rather than a parallelogram.

Challenge: Find counter-examples for the versions of #5 and #6 that only require a quadrilateral rather than a parallelogram with the particular diagonal property.