

Geogebra Demonstration

Quadrilaterals with Equal Diagonals

The Demonstration

We have proved that if a quadrilateral is a rectangle, then the diagonals are equal. Is the converse true? If a quadrilateral has equal diagonals is it necessarily a rectangle? The quadrilateral constructed here has equal diagonals. Note that it is not necessarily a rectangle, so the converse is clearly false. All that is needed to prove a statement to be false is to show a counterexample. This graphical demonstration allows for the construction of an infinite number of counterexamples.

Geogebra Notes

To create a line segment with fixed length, I have constructed a circle with specified center and radius. The desired line segment is constructed to be the radius of the circle. The point on the circle is constrained to move in such a way that it is always a fixed distance from the center point. The circle can then be hidden and you have a line segment that retains a fixed length. In this demonstration it was desired to make two such segments cross, so rather than construct the segments as radii of two circles, I constructed arcs that would force the two line segments to cross. Display all of the hidden construction lines to see the complete layout.

On Your Own

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