



Exploring Diagonals of Quadrilaterals

Student Activity

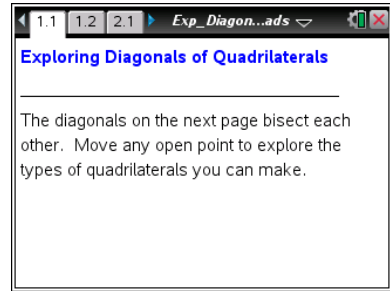


Name _____

Class _____

Open the TI-Nspire document *Exp_Diagonals_of_Quads.tns*.

What type of quadrilateral can you create if you know the diagonals are perpendicular bisectors of each other? What if the diagonals were mutually bisecting? What if they were perpendicular? In this activity, you will investigate these different possibilities to determine the characteristics of diagonals of various quadrilaterals.



Move to page 1.2.

1. The two diagonals on this page are special because they always bisect each other. Drag any open point to make a quadrilateral. To see the quadrilateral, select \blacktriangle on the screen. Drag a point. To see angle measurements or side lengths, select \blacktriangle . Then drag a point.

a. Try to form each of the quadrilaterals in the table below. Record your findings in the table.

	Parallelogram (not rectangle, not rhombus)	Rectangle (not square)	Rhombus (not square)	Kite (not rhombus)	Square	Trapezoid	Quadrilateral with four different side lengths
Yes or No?							
Why or Why not?							

b. What special quadrilaterals can be formed?



Each of the remaining problems in the file contains two diagonals that have some special property. Move through pages 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 5.1, and 5.2.

2. For each problem, what special quadrilaterals can be formed? Record your findings in the appropriate rows in the table below.

Pg	Diagonal Properties	Parallelogram (not rectangle, not rhombus)	Rectangle (not square)	Rhombus (not square)	Kite (not rhombus)	Square	Trapezoid	Quadrilateral with four different side lengths
1.2	<i>Diagonals bisect each other</i>							
2.2	<i>One diagonal is a perpendicular bisector of the other</i>							
3.2	<i>Diagonals bisect vertex angles</i>							
4.2	<i>Diagonals are congruent</i>							
5.2	<i>Diagonals are perpendicular</i>							

Return to page 1.2.

3. a. If the diagonals bisect each other, then the quadrilateral *must* be what type of figure?
- b. Justify your answer.

Return to page 2.2.

4. a. If one diagonal is the perpendicular bisector of the other, then the quadrilateral *must* be what type of figure?
- b. Justify your answer.



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5. a. If the diagonals of a quadrilateral bisect its vertex angles, then the quadrilateral *must* be what type of figure?
- b. Justify your answer.