Polygon Hierarchy: Quadrilaterals NAME:

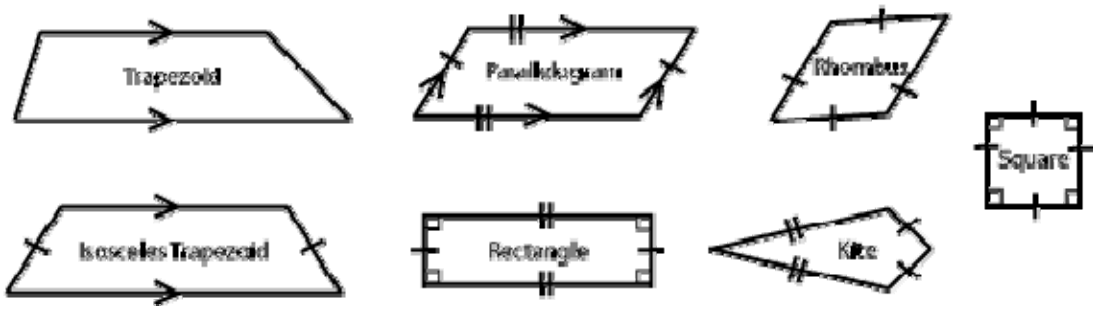
For each *italicized* quadrilateral down the left column, decide if that quadrilateral is an example of the **bold** quadrilateral along the top row. In other words, using the definitions provided, must the *italicized* quadrilateral also be an example of the **bold** quadrilateral? If so, place a check mark in the corresponding table cell. To get you started, notice how the *trapezoid, isosceles trapezoid, parallelogram, rectangle, kite, rhombus,* and *square* are all examples of **quadrilaterals** in general. Hence, I have placed a check mark in those cells.

If the *italicized* quadrilateral is <u>not</u> an example of the **bold** quadrilateral, place a NO in the corresponding table cell. Also, draw a quick picture to support a NO conclusion. That is, draw a picture that satisfies the *italicized* quadrilateral but not the **bold** quadrilateral. To get you started here, notice how just any old *quadrilateral* could not be considered to be a **trapezoid**. Hence, I have put NO and a drawing of a quadrilateral that is clearly not a trapezoid in the cell.

The grayed out cells can be ignored.

Be sure your reasoning goes the correct way. For instance, a *trapezoid* is always a **quadrilateral**, but a *quadrilateral* is not necessarily a **trapezoid**. Notice how these facts are represented in the table.

The book's definitions, with some minor alterations, are provided to help you. Below are sample pictures of the quadrilaterals. Notice the marks that show congruent or parallel sides. I left some marks out because of space limitations. These pictures will help you visualize the definitions but are not meant to replace the definition. You should not infer information from the pictures alone.



	Quadrila-teral	**Trapezoid**	**Isosceles Trapezoid**	**Parallelogram**	**Rectangle**	**Kite**	**Rhombus**	**Square**
Quadrilateral (polygon with four sides)		NO 						
Trapezoid (quadrilateral with at least 1 pair of parallel sides)	✓							
Isosceles Trapezoid (trapezoid in which the non-parallel sides are congruent but the parallel sides are not congruent)	✓							
Parallelogram (quadrilateral in which both pairs of opposite sides are parallel and congruent)	✓							
Rectangle (parallelogram with 4 right angles)	✓							
Kite (quadrilateral with 2 adjacent sides congruent and the other 2 sides also congruent)	✓							
Rhombus (quadrilateral with all sides congruent or parallelogram with 2 adjacent sides congruent)	✓							
Square (rectangle with all sides congruent)	✓							

We will use our table to draw a diagram that shows the nested nature of these quadrilaterals. This is referred to as their hierarchy. Count the number of check marks in (and write this number beneath) each column. We will call this number the “number of associations” a shape has.

To organize your information, write the quadrilaterals in order from greatest to least number of associations.

We will now draw our diagram. A shape with a larger number of associations will appear above a shape with fewer associations. A shape with zero associations will have no shapes trailing beneath it. I have drawn the general form of the diagram and filled in the first couple of shapes. Finish the diagram by replacing the question marks with the appropriate shape names. Again, a shape should appear beneath another if it must be considered an example of the higher shape. For instance, the trapezoid is always a quadrilateral. Hence, the trapezoid appears beneath the quadrilateral in the diagram.