

Discover the Properties of Parallelograms (Geometer's Sketchpad)

More Specific statement of this topic: Through the discovery approach, students are to use Geometer's Sketchpad in creating Parallelograms that will illustrate the six properties.

What the students already know: Most students will know that parallelograms are 4-sided figures, both pairs of opposite sides are parallel, parallel lines have the same slope. Some students will know that the sum of the interior angles is 360 degrees.

What part will the students have to figure out on their own? The students will have to be taught how to use the basic mechanics of Sketchpad in order to create a parallelogram. They will also need to know how to calculate and measure angles, side lengths, and slopes.

Materials: Geometer's Sketchpad, Computers, Investigation Template, paper and pencil

Context: Explain that Parallelograms are a type of Quadrilateral that has specific properties and that all Parallelograms have the same properties. The properties can be measured by using Sketchpad.

Statement of the task: Students will need to construct a parallelogram in Geo Sketchpad. Students should be able to determine parallel sides, congruent sides, supplementary angles, and Diagonal lengths are bisected. Then, the students should list and apply discovered properties to specific problems.

Where might they get stuck? Students might get stuck creating the parallelograms using Sketchpad and determining measurements. Besides having difficulties with Sketchpad, students may have troubles discovering the properties "Diagonals bisect each other", "Consecutive angles supplementary", and "One pair of opposite sides are both parallel and congruent."

What questions can I use to prompt them without giving the answers away?

- Analyze the name parallelogram and tell me the things you know about the name.
- What do you know about parallel lines, from algebra?
- What does congruent mean?
- What do supplementary angles add up to?
- What types of angles are supplementary angles (think back to parallel lines being cut by a transversal)?
- What can you draw inside the diagram? (Diagonal)
- Do the diagonals look congruent? (No...but there is something special about them)
- Can you think of a shape where the diagonals are congruent?
- Can you think of a figure in real life that is a parallelogram?