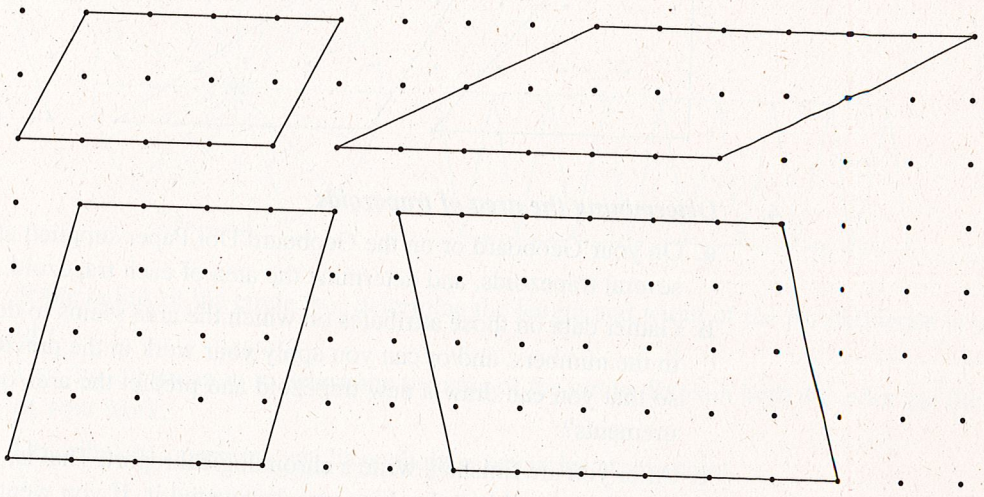
PART 2: Understanding area formulas

1. ***Determining the area of parallelograms*** Even if you remember certain area formulas, the purpose of these explorations is not to get the formula but to understand why it works. The *why* enables us to apply our understanding to new situations.

   a. Determine the area of the parallelograms below by a means other than using a formula. Can you see any patterns that hold for all four parallelograms? (Make more parallelograms if you wish.)

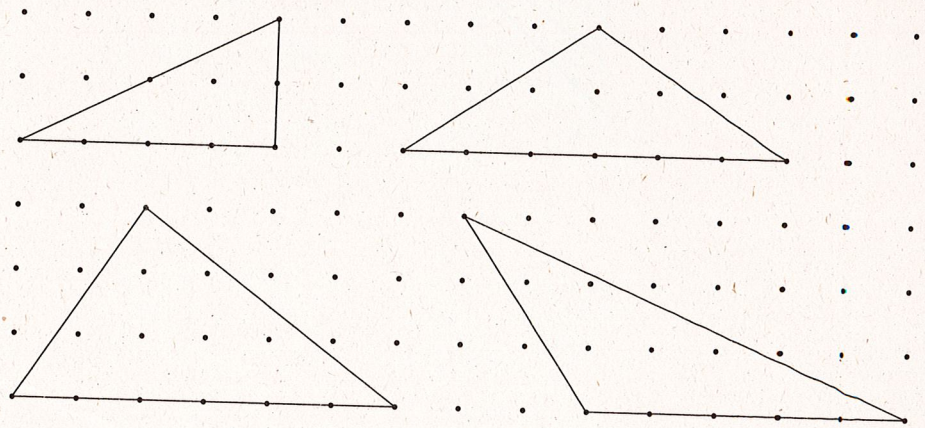
   b. State and *justify* a formula for determining the area of *any* parallelogram.



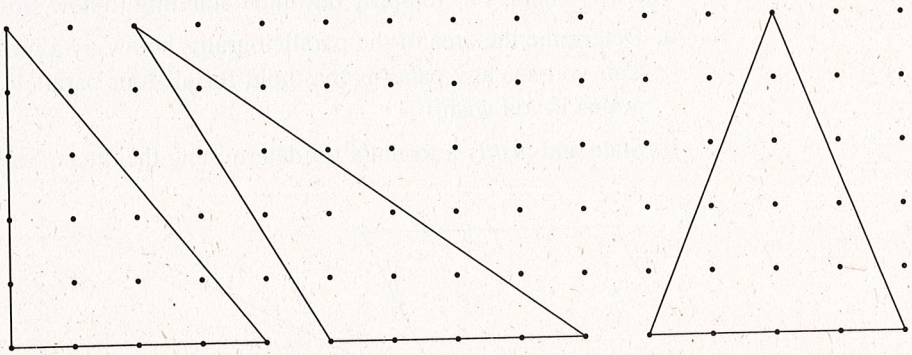
2. ***Determining the area of triangles*** We can apply our understanding of the area of parallelograms to determine a way to find the area of any triangle.

   a. Determine the area of the triangles below by a means other than using a formula. Can you discern any commonalities that enable us to determine the area of any triangle? (Make more triangles if you wish.)

   b. State and *justify* a formula for determining the area of *any* triangle.



3. There is an old saying that "seeing is believing." Determine the areas of the triangles below—the right triangle, the obtuse triangle, and the isosceles triangle. What did you discover? Can you explain why what you discovered is true?



4. ***Determining the area of trapezoids***

   a. On your Geoboard or on the Geoboard Dot Paper supplied at the end of the book, make several trapezoids, and determine the area of each trapezoid.

   b. Gather data on those attributes on which the area seems to depend. Can you see patterns in the numbers, and/or can you apply your work in the previous steps in this exploration so that you can draw a new trapezoid and predict the area on the basis of certain measurements?

   c. After you are finished, write a chronological report. That is, tell the reader not only what you discovered but also how you discovered it. If you went down blind alleys or made and then discarded a hypothesis, help the reader to see why the blind alley or hypothesis made sense at the time and what you learned from that work.