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# Math Mammoth Geometry 1

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# Introduction

*Math Mammoth Geometry 1* gives the student a thorough view of basic plane geometry, as taught in elementary grades (approximately up through grade 5). The emphasis is on learning through drawing.

**Lines, Rays, and Angles** concentrates on the concept of angle and how to tell which angle is 'bigger'. You can show the student with two pens how the angle opens and gets bigger. You can also use longer pens, etc., and demonstrate how the measure of the angle does not depend on the size of the sides but instead of "how much it has opened" or how much of the arc of the circle it has drawn.

**Measuring Angles** is a simple lesson teaching how to measure and draw angles with a protractor.

**Parallel and Perpendicular Lines** not only explains these terms, but also studies angles formed when a line intersects two parallel lines. We arrive at parallelograms and learn something about its angles.

The lesson on **Triangles** classifies them according to angles (acute, right, or obtuse triangles). This lesson has lots of drawing exercises. In particular, the problems about copying a triangle prepare the student for the (high school level) concepts of congruency tests.

**Angles of a Triangle** is a simple lesson about the angle sum in a triangle. The picture shown actually proves the sum to be what it is.

Triangles can also be classified according to their sides, and the next lesson on **Equilateral and Isosceles Triangles** does just that. Again there is a lot of drawing to do.

**Quadrilaterals** lets the student explore the seven different kinds of quadrilaterals first by drawing various kinds. Then, the angle sum of a quadrilateral is studied. The lesson also has a quadrilaterals puzzle that stretches the mind about their attributes.

**Polygons 1** has easy problems geared more towards 3rd grade, and lesson **Polygons 2** continues the topic. **Polygon Tilings** is a fun, simple lesson with possibility for creativity.

**Circles** concentrates on the concept itself, not on any calculations, and contains many drawing exercises where the student needs to understand the relationship between the radius and the diameter. A few of the problems here are actual geometric constructions.

**Congruent Figures** briefly explores this concept. Then we go onto **Similar Figures** as a contrast. Again plenty of drawing problems are supplied.

**Symmetry** is a fairly simple lesson. After that, we study **Congruent Transformations** and the basics of translation, reflection, and rotation.

The last part of the book has lessons on perimeter, area, and volume.

The problems in the lesson on **Perimeter** aren't simply about finding the perimeter, but also touch on the "inverse" problem.

The lessons on *area* have a definite train of thought building up to the area of triangles. That way the formula for the area of triangles is not just a dry memorized rule but a proven and justified fact.

First of all, **Getting Started with Area** is meant for 3rd-4th grade, teaching the concept itself as "little squares".

**Area of Rectangle** practices this concept a lot, including problems with 'compound' figures.

**Area Versus Perimeter** has plenty of problems where students need to distinguish and compare between these two concepts.

In the lesson **Area of Right Triangles**, the emphasis is on realizing how a right triangle is half of a rectangle, and so its area is also half of the area of the rectangle.

**Area of Parallelograms** illustrates how parallelograms have the same area as a rectangle with the same altitude and base.

**Area of Triangles** shows how triangles are half of parallelograms, and proves the common area rule that way.

**Volume** is a basic lesson about little cubes. Lots of word problems are included.

**Three-Dimensional Figures** is an exploratory lesson concentrating on remembering the names of various basic figures, and finding out about their edges, vertices, and faces.

*I wish you success in your math teaching!*

*Maria Miller, the author*