

# Math Kangaroo Curriculum for grades 9 and 10

## 1a. Geometry – plane geometry

- symmetry
- Pythagorean theorem
- similarity
- area of simple plane figures
- angle calculations (parallel and normal angles, angles in a circle, angles in triangles and simple polygons)
- circles
- parabola
- rotation, translation, scaling
- point coordinates without computations
- simple regular polygons

## 1b. Geometry – solid geometry

- spatial relationships
- cubes, prisms, pyramids
- spheres, cones, cylinders
- Platonic solids
- volume
- 3-d movement of one- and two-dimensional objects, i.e. knots, folding, etc.

## 2. Number Theory

- number puzzles
- simple usage of powers of numbers
- prime numbers
- use of prime factorisation (low level)
- using digits
- number patterns
- simple Diophantine equations
- very simple modulo calculations, no modulo calculus

## 3a. Functions, Sequences

- interpreting simple graphs
- simple arithmetic and geometric sequences
- simple functional equations
- simple finite recursions



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## 3b. Algebra

- addition, subtraction and multiplication of polynomials
- powers and roots
- equations, simple quadratic equations
- simple systems of linear equations
- simple inequalities; solutions with sets written as intervals

## 4a. Combinatorics and Probability

- simple combinatorics as for instance countable permutations
- simple probability without theoretical knowledge
- inclusion/exclusion principle

## 4b. Logic / Puzzles

