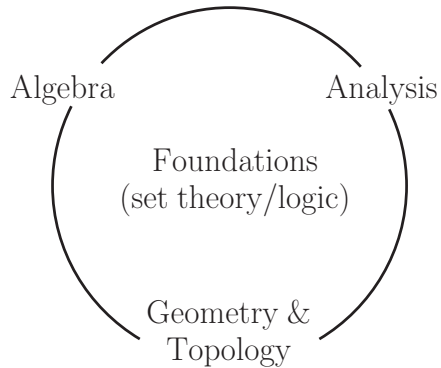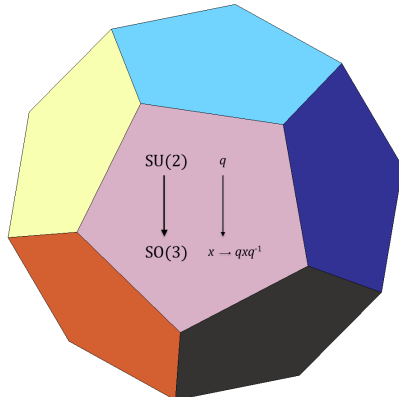# Abstract Algebra
Math 303 and 304

This is a yearlong course in **Abstract Algebra**. As the oldest of the three fundamental pillars of Pure Mathematics – see the circular diagram above – algebra is both remarkably beautiful and widely applicable. The clarity gained by studying the subject from an abstract perspective will soon become apparent and will help us understand the concept of **symmetry** in mathematics and in nature. For example, there are exactly 60 symmetries of the dodecahedron shown above, together forming a remarkable a **group** known as A_5 that will feature at several points during the course; two other symmetry groups that are fundamental to the study of physics, SU(2) and SO(3), are featured on the pink face of the dodecahedron. This course will study many other notions, including **rings**, **fields**, **vector spaces**, **modules** and their **homomorphisms** (structure preserving maps), with the ultimate goal of unravelling the theory of equations. Here's one critical diagram that arises in group theory known as the "universal property of quotient groups". Ask us about it!

$$G \xrightarrow{\ p\ } G/K$$

with f, g, H

Take this course! You won't regret it.