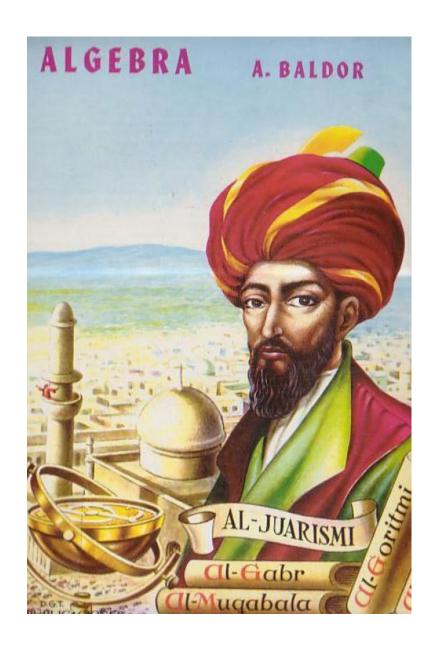Muhammed ibn Musa
al-Khwarizmi

A page from *Kitab al-jabr w'al muqabala*
(Book of bonesetting and balancing)

Statue of al-Khwarizmi outside the city walls of
Khiva (Khorezm), Uzbekistan

When I considered what people generally want in calculating, I found that it is always a number.

Emmy Noether

Bartel van der Waerden

MODERNE ALGEBRA

VON

DR. B. L. VAN DER WAERDEN

O. PROFESSOR AN DER UNIVERSITÄT
GRONINGEN

UNTER BENUTZUNG VON VORLESUNGEN
VON
E. ARTIN UND E. NOETHER

ERSTER TEIL

Springer-Verlag Berlin Heidelberg GmbH
1930

Group: collection of **reversible** transformations (of anything)

- Ubiquitous in mathematics (and physics, statistics, computer science, chemistry)
- First important example of **axiomatic structure**
- The axioms are simple but have surprisingly precise consequences

High points of the course

- Study of **permutation** (symmetric) groups
- Groups as transformations of **sets**
- Developing methods to list all finite groups of small order