

Problem set 8

CONSTRUCTIONS WITH RULER AND COMPASS

1. Express $\cos 15^\circ$ in terms of real square roots.
2. Prove that the regular pentagon can be constructed by ruler and compass, by field theory, and by finding an explicit construction.
3. Is the regular 9-gon constructible by ruler and compass ?
4. Is it possible to construct a square whose area is that of a given triangle ?
5. Thinking of the plane as the complex plane, describe the set of constructible points as complex numbers.