MATH 162A Review: Invariant Theory

Facts to Know:

Linear algebra, the invariant theory of linear transformation.

Examples:

1. Let A be a square matrix. Prove that
$$\limsup_{k\to\infty} |\mathrm{Tr}(A^k)|^{1/k}$$
exists.

2. Let A be a 2×2 symmetric real-valued matrix. Prove that
$$(\mathrm{Tr}(A))^2 \geq 4\det(A).$$