

In the thesis we introduce arithmetic geometric mean sequences, firstly over real numbers and then over finite fields \mathbb{F}_q such that $q \equiv 3 \pmod{4}$. We connect the sequences with graphs and prove some properties over general finite fields for these graphs. We also extend arithmetic geometric mean sequences over \mathbb{F}_q such that $q \equiv 5 \pmod{8}$ and we show a connection between elliptic curves and arithmetic geometric mean sequences over \mathbb{F}_q such that $q \equiv 3 \pmod{4}$.