1125-11-195 **Junxian Li*** (jli135@illinois.edu), **Kyle Pratt** (kpratt4@illinois.edu) and **George Shakan** (george.shakan@gmail.com). *A lower bound for the least prime in an arithmetic progression.*

Fix k a positive integer, and let ℓ be coprime to k. Let $p(k, \ell)$ denote the smallest prime equivalent to $\ell \pmod{k}$, and set $P(k)$ to be the maximum of all the $p(k, \ell)$. We seek lower bounds for $P(k)$. In particular, we show that for almost every k one has $P(k) \gg \phi(k) \log k \log_2 k \log_4 k / \log_3 k$, answering a question of Ford, Green, Konyangin, Maynard, and Tao. We rely on their recent work on large gaps between primes. Our main new idea is to use sieve weights to capture not only primes, but also small multiples of primes. We also give a heuristic which suggests that

$$\liminf_{k} \frac{P(k)}{\phi(k) \log^2 k} = 1.$$

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