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Some applications of graph theory to number theory (In English)

Proc. 2nd Chapel Hill Conf. Combin. Math. Appl., Univ. North Carolina 1970, 136-145 (1970).

[For the entire collection see Zbl 208.00201.]

Several applications of graph theory to number theory are discussed mostly without proofs. The following result is proved in detail: Let $a_1 < \ldots < a_k \leq x$, $k > \pi(x)$ be a sequence of integers. Denote by $f(k, x)$ the smallest integer r so that there always are r primes $p_1, \ldots, p_r$ for which more than r a's are of the form $\prod_{i=1}^{r} p_i^{\alpha_i}$. The author and Straus proved

$$f(\pi(x) + 1, x) = (4 + o(1))\frac{x^{1/2}}{\log x}.$$

A good estimate is given for $f(k, x)$ if $k = cx$.

Classification:
11B75 Combinatorial number theory
11N99 Multiplicative number theory