RESEARCH PROBLEMS

26. Barney Bissinger: *A functional iteration problem.*

For two real variables x, y, the equalities $2\min(x, y) = x+y-|x-y|$ and $2\max(x, y) = x+y+|x-y|$ are useful (Fine, Proc. Amer. Math. Soc. vol. 5 (1954) p. 247). An extension for n real variables is given by $f_2(x_1, x_2) = x_1+x_2+f_1(x_1-x_2)$, $f_n(x_1, x_2, x_3, \cdots, x_n) = f_{n-1}(f_2(x_1, x_2), x_3, \cdots, x_n)$, $n \geqq 3$. When $f_1(x) = |x|$, $2^{1-n}f_n = \max[x_j, 1 \leqq j \leqq n]$ and $\lim_{n\to\infty} 2^{1-n}f_n = \text{l.u.b. } [x_j, j=1, 2, \cdots]$. Similar results hold for the minimum and g.l.b. by choosing $f_1(x) = -|x|$. Interest has been shown in similar work (advanced problem 4646, Amer. Math. Monthly vol. 62 (1955) p. 447). For what functions f_1 does $\lim_{n\to\infty} 2^{1-n}f_n$ exist? (Received July 15, 1955.)

27. Albert Wilansky and Karl Zeller. *Inverses of infinite matrices.*

May an infinite matrix have a left inverse and a right inverse but not have a two-sided inverse? Reference: Wilansky and Zeller, Proc. Amer. Math. Soc. vol. 6 (1955) pp. 414–420. (Received July 15, 1955.)

28. E. A. Michael: *Paracompact spaces.*

Is the cartesian product of a paracompact space and a metric space paracompact, or even normal? What if both spaces have the Lindeloef property? (Reference: E. Michael, *A note on paracompact spaces*, Proc. Amer. Math. Soc. vol. 4 (1953) pp. 831–838). (Received July 18, 1955.)

29. E. A. Michael: *Paracompact spaces.*

Must the image of a paracompact space, under a continuous, closed mapping, be paracompact? (The answer is (a) yes, if the inverse image of every point is compact, (b) yes, if "paracompact" is everywhere replaced by "normal," (c) no, if "paracompact" is everywhere replaced by "metric".) (Received August 12, 1955.)