APPENDIX
WEAK* COMMUTING MAPPINGS AND FIXED POINTS

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The aim of this paper is to prove a theorem on common fixed points for a family of mappings on a complete metric space. Illustrative examples are given to support the degree of generality of our theorem.

1. INTRODUCTION

Jungck generalized the well-known Banach contraction principle by taking a continuous mapping in place of identity mapping.

Theorem A (Jungck)—A continuous self-mapping $A$ of a complete metric space $(X, d)$ has a fixed point if and only if there exists a $\alpha \in (0, 1)$ and a mapping $S : X \to X$ which commutes with $A$ and satisfies:

(i) $S(Y) \subseteq A(X)$

(ii) $d(Sx, Sy) \leq \alpha d(Ax, Ay)$, for all $x, y \in X$.

Indeed, $S$ and $A$ have a unique common fixed point.

In recent years Theorem A has been generalized and extended in various ways by many authors. Fisher proved the following:

Theorem B—Let $S$ and $T$ be continuous mappings of a complete metric space $(X, d)$ into itself. Then $S$ and $T$ have a common fixed point in $X$ if and only if there exists a continuous mapping $A$ of $X$ into $S(X) \cap T(X)$ which commutes with $S$ and $T$ and satisfies the inequality

(i) $d(Ax, Ay) \leq \alpha d(Sx, Ty)$ for all $x, y \in X$, where $0 < \alpha < 1$.

It should be noted that in all the extensions and generalizations of Theorem A a family of commuting mappings have been considered.
(7) On taking \( T = I_M, a_1 = 1 \) and \( x_2 = x_3 = a_4 = a_5 = x_6 = x_7 = 0 \) in Theorem 2, we obtain Theorem 1 of Fisher's.

REFERENCES


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Date: 2 SEP 1985
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Dr. H.K. Pathak
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Kalyan Mahavidyabaya
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Dear Dr. H.K. Pathak:

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This paper is likely to appear in Vol.XXIII or Vol.XXIV, No.1-2, issue of PAMS.

Yours sincerely,

(P. L: MAGGU)
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Kalyan Mahavidyalaya
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Head, Dept. of Mathematics  
Kalyan Mahavidyalaya  
Bhilainagar 490006

January 22, 1986

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