

COMMON FIXED POINTS FOR ASYMPTOTIC POINTWISE NONEXPANSIVE MAPPINGS

B. PANYANAK^{*,**} AND P. PASOM^{*}

^{*}Department of Mathematics, Faculty of Science
Chiang Mai University, Chiang Mai 50200, Thailand

^{**}Materials Science Research Center, Faculty of Science
Chiang Mai University, Chiang Mai 50200, Thailand

Correspondence should be addressed to B. Panyanak; banchap@chiangmai.ac.th

Abstract. A common fixed point theorem for a commuting family of asymptotic pointwise nonexpansive mappings in a uniformly convex Banach space is proved. Weak and strong convergence of an iterative sequence defined by two of such mappings are also established. Our results generalize the results of Kirk and Xu [7], Khan and Takahashi [4] and Kozłowski [8].

Key Words and Phrases: Common fixed point, asymptotic pointwise nonexpansive mapping, weak convergence, strong convergence, uniformly convex Banach space.

2010 Mathematics Subject Classification: 47H10, 54H25.

Acknowledgement. This research was supported by the National Research University Project under Thailand's Office of the Higher Education Commission. The second author also thanks the Graduate School of Chiang Mai University, Thailand.

REFERENCES

- [1] R. Bruck, T. Kuczumow, S. Reich, *Convergence of iterates of asymptotically nonexpansive mappings in Banach spaces with the uniform Opial property*, Collect. Math., **65**(1993), 169-179.
- [2] N. Hussain and M. A. Khamsi, *On asymptotic pointwise contractions in metric spaces*, Nonlinear Anal., **71**(2009), 4423-4429.
- [3] M.A. Khamsi, W.M. Kozłowski, *On asymptotic pointwise nonexpansive mappings in modular function spaces*, J. Math. Anal. Appl. **380**(2011), 697-708.
- [4] S.H. Khan, W. Takahashi, *Approximating common fixed points of two asymptotically nonexpansive mappings*, Sci. Math. Japon., **4**(2001), 133-138.
- [5] W.A. Kirk, *Geodesic geometry and fixed point theory II*, in: Fixed Point Theory and its Applications, Proc. of the International Conference on Fixed Point Theory and Applications, Yokohama Publ., 2004, 113-142.
- [6] W.A. Kirk, *Fixed points of asymptotic contractions*, J. Math. Anal. Appl., **277**(2003), 645-650.
- [7] W.A. Kirk, H.K. Xu, *Asymptotic pointwise contractions*, Nonlinear Anal., **69**(2008), 4706-4712.
- [8] W.M. Kozłowski, *Fixed point iteration processes for asymptotic pointwise nonexpansive mappings in Banach spaces*, J. Math. Anal. Appl., **377**(2011), 43-52.
- [9] J. Schu, *Weak and strong convergence to fixed points of asymptotically nonexpansive mappings*, Bull. Austral. Math. Soc. **43**(1991), 153-159.
- [10] T. Suzuki, *Fixed point theorems and convergence theorems for some generalized nonexpansive mapping*, J. Math. Anal. Appl., **340**(2008), 1088-1095.

- [11] E. Zeidler, *Nonlinear Functional Analysis and Its Applications I, Fixed Points Theorems*, Springer-Verlag, New York, Heidelberg, 1986.

Received: March 30, 2011; Accepted: May 19, 2011.

