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THEOREM 7.3. $T \cong PIP^+(S^1)$.

The three functions in $PIP^+(S^1)$ corresponding to A , B , and C are the following.

$$A(t) = \begin{cases} \frac{t}{t+1}, & 0 \leq t \leq \frac{1}{2} \\ \frac{-t+1}{-5t+4}, & \frac{1}{2} \leq t \leq \frac{2}{3} \\ \frac{2t-1}{t}, & \frac{2}{3} \leq t \leq 1 \end{cases} \quad B(t) = \begin{cases} t, & 0 \leq t \leq \frac{1}{2} \\ \frac{3t-1}{4t-1}, & \frac{1}{2} \leq t \leq \frac{2}{3} \\ \frac{-6t+5}{-11t+9}, & \frac{2}{3} \leq t \leq \frac{3}{4} \\ \frac{2t-1}{t}, & \frac{3}{4} \leq t \leq 1 \end{cases}$$

$$C(t) = \begin{cases} \frac{-3t+2}{-5t+3}, & 0 \leq t \leq \frac{1}{2} \\ \frac{2t-1}{t}, & \frac{1}{2} \leq t \leq \frac{2}{3} \\ \frac{5t-3}{7t-4}, & \frac{2}{3} \leq t \leq 1 \end{cases}$$

REFERENCES

- [Ban] BANACH, S. Sur le problème de la mesure. *Fund. Math.* 4 (1923), 7–33.
- [BieS] BIERI, R. and R. STREBEL. On groups of PL-homeomorphisms of the real line. Unpublished manuscript.
- [Bri] BRIN, M. G. The chameleon groups of Richard J. Thompson: automorphisms and dynamics. Preprint.
- [BriS] BRIN, M. G. and C. C. SQUIER. Groups of piecewise linear homeomorphisms of the real line. *Invent. math.* 79 (1985), 485–498.
- [Bro1] BROWN, K. S. Finiteness properties of groups. *J. Pure App. Algebra* 44 (1987), 45–75.
- [Bro2] ——— The geometry of finitely presented infinite simple groups. *Algorithms and Classification in Combinatorial Group Theory* (G. Baumslag and C. F. Miller III, eds.), MSRI Publications, vol. 23, Springer-Verlag (Berlin, Heidelberg, New York), 1992, pp. 121–136.
- [Bro3] ——— The geometry of rewriting systems: a proof of the Anick-Groves-Squier theorem. *Algorithms and Classification in Combinatorial Group Theory* (G. Baumslag and C. F. Miller III, eds.), MSRI Publications, vol. 23, Springer-Verlag (Berlin, Heidelberg, New York), 1992, pp. 137–163.
- [BroG] BROWN, K. S. and R. GEOGHEGAN. An infinite-dimensional torsion-free FP_∞ group. *Invent. math.* 77 (1984), 367–381.
- [C] CHOU, C. Elementary amenable groups. *Illinois J. Math.* 24 (1980), 396–407.
- [Da] DAY, M. Amenable semigroups. *Ill. J. Math.* 1 (1957), 509–544.
- [DeV] DENNIS, R. K. and L. N. VASERSTEIN. Commutators in linear groups. *K-theory* 2 (1989), 761–767.

- [Dy1] DYDAK, J. A simple proof that pointed connected FANR-spaces are regular fundamental retracts of ANR's. *Bull. Polon. Acad. Sci. Ser. Sci. Math. Astronom. Phys.* 25 (1977), 55–62.
- [Dy2] ——— 1-movable continua need not be pointed 1-movable. *Bull. Polon. Acad. Sci. Ser. Sci. Math. Astronom. Phys.* 25 (1977), 485–488.
- [Fo] FORDHAM, S.B. *Minimal length elements of Thompson's group F*. Ph.D. Thesis, Brigham Young University, 1995.
- [FrH] FREYD, P. and A. HELLER. Splitting homotopy idempotents II. *J. Pure and Applied Algebra* 89 (1993), 93–106.
- [GeS] GERSTEN, S.M. and J.R. STALLINGS (eds.). *Combinatorial Group Theory and Topology*. Annals of Mathematics Studies # 111, Princeton University Press, Princeton, New Jersey, 1987.
- [GhS] GHYS, E. and V. SERGIESCU. Sur un groupe remarquable de difféomorphismes du cercle. *Comm. Math. Helv.* 62 (1987), 185–239.
- [Gr] GREENBERG, P. *Projective aspects of the Higman-Thompson group*. Group Theory from a Geometrical Viewpoint: 26 March - 6 April 1990, ICTP, Trieste, Italy (E. Ghys, A. Haefliger and A. Verjovsky, eds.), World Scientific, Singapore, 1991, pp. 633–644.
- [GrS] GREENBERG, P. and V. SERGIESCU. An acyclic extension of the braid group. *Comm. Math. Helv.* 66 (1991), 109–138.
- [Gri1] GRIGORCHUK, R.I. Degrees of growth of finitely generated groups, and the theory of invariant means. *Math USSR Izvestia* 25 (2) (1985), 259–300.
- [Gri2] ——— Some results on bounded cohomology. *Combinatorial and Geometric Group Theory Edinburgh 1993* (A.J. Duncan, N.D. Gilbert and J. Howie, eds.), London Mathematical Society Lecture Note Series, vol. 204, Cambridge University Press, Cambridge, 1995, pp. 111–163.
- [GriK] GRIGORCHUK, R.I. and P.F. KURCHANOV. Some questions of group theory related to geometry, Algebra VII (A.N. Parshin and I.R. Shafarevich, eds.). *Encyclopaedia of Mathematical Sciences*, vol. 58. Springer-Verlag (Berlin, Heidelberg, New York), 1993, pp. 167–232.
- [Gro] GROMOV, M. Hyperbolic groups. *Essays in Group Theory* (S.M. Gersten, ed.). MSRI Publications, vol. 8. Springer-Verlag (Berlin, Heidelberg, New York), 1987.
- [GuS] GUBA, V.S. and M.V. SAPIR. The Dehn function and a regular set of normal forms for R. Thompson's group F . Preprint.
- [H] HIGMAN, G. Finitely presented infinite simple groups. *Notes on Pure Mathematics* 8. Australian National University, Canberra (1974).
- [McT] MCKENZIE, R. and R.J. THOMPSON. An elementary construction of unsolvable word problems in group theory. *Word Problems* (W.W. Boone, F.B. Cannonito and R.C. Lyndon, eds.). Studies in Logic and the Foundations of Mathematics, vol. 71. North-Holland, Amsterdam, 1973, pp. 457–478.
- [Mi] MIHALIK, M. Ends of groups with the integers as quotient. *J. Pure Appl. Algebra* 35 (3) (1985), 305–320.
- [N] NEUMANN, J. VON. Zur allgemeinen Theorie des Maßes. *Fund. Math.* 13 (1929), 73–116.

- [O] OLSHANSKII, A. Ju. On a geometric method in the combinatorial group theory. *Proc. I. C. M. Warsaw*, vol 1, 1984, pp. 415–424.
- [P] PATERSON, A. L. T. *Amenability*. Mathematical Surveys and Monographs, Number 29. American Mathematical Society, Providence, 1988.
- [RS] ROURKE, C. P. and B. J. SANDERSON. *Introduction to Piecewise-Linear Topology*. *Ergebnisse der Mathematik und ihrer Grenzgebiete*, vol. 69. Springer-Verlag (Berlin, Heidelberg, New York), 1972.
- [Sc] SCOTT, E. A. A tour around finitely presented infinite simple groups. *Algorithms and Classification in Combinatorial Group Theory* (G. Baumslag and C. F. Miller III, eds.), MSRI Publications, vol. 23. Springer-Verlag (Berlin, Heidelberg, New York), 1992, pp. 83–119.
- [St] STEIN, M. Groups of piecewise linear homeomorphisms. *Trans. Amer. Math. Soc.* 332 (1992), 477–514.
- [T1] THOMPSON, R. J. Handwritten notes.
- [T2] — Embeddings into finitely generated simple groups which preserve the word problem. *Word Problems II: The Oxford Book*. (S. I. Adian, W. W. Boone and G. Higman, eds.). *Studies in Logic and the Foundations of Mathematics*, vol. 95. North-Holland, Amsterdam, 1980, pp. 401–441.
- [W] WAGON, S. *The Banach-Tarski Paradox*. Cambridge University Press, Cambridge, 1985.

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