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## Smales problem for critical points on certain two rays

Hinkkanen A., Kayumov I.

*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

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### Abstract

Let  $f$  be a polynomial of degree  $n \geq 2$  with  $f(0) = 0$  and  $f'(0) = 1$ . We prove that there is a critical point  $\zeta$  of  $f$  with  $|f(\zeta)/\zeta| \leq 1/2$  provided that the critical points of  $f$  lie in the sector  $\{re^{i\theta} : r > 0, |\theta| \leq \pi/6\}$ , and  $|f(\zeta)/\zeta| < 2/3$  if they lie in the union of the two rays  $\{1 + re^{\pm i\theta} : r \geq 0\}$ , where  $0 < \theta \leq \pi/2$ . Copyright © 2010 Australian Mathematical Publishing Association Inc.

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### Keywords

Critical points, Polynomials, Smales problem