

Question.

Is it true that for each

$g \geq 3$, $\exists G_g$ s.t.

(a) $\text{girth}(G_g) \geq g$;

(b) $\Delta(G_g) \leq 5$;

(c) $\chi(G_g) \geq 4$?

Comment 1: Tashkinov (1978) proved
for $\Delta = 6$.

Comment 2: For $\Delta = 4$ also
not known

A. Kostochka

kostochk@math.uiuc.edu