

STEP III, 2018, Q5 EC

Question 5

A little under half the candidates attempted this, scoring marginally less on average than on question 1. Some candidates used the arithmetic mean/geometric mean inequality which was what the question was proving in part (iii), and so were heavily penalised as their arguments were thus circular. Part (i) was generally well done, with most justifying that their steps were reversible to obtain 'if and only if'. Marks were sometimes lost when justifying that $G_k > 0$ was not used to legitimise division by G_k and also that inequalities did not change sign. Part (ii) was well done too, though many candidates did not justify the 'only if', although some tried to use part (i) to prove (ii), which could not succeed. Part (iii) expressly required deduction, and only deduction, so those who had learned another proof of the inequality and just copied it out could not be rewarded. Many just used the results of (i) and (ii) without justifying why they could be used and some were imprecise with their induction arguments.



NextStepMaths.com

To view mark schemes, fully worked solutions and examiner's comments, and for more details about tutoring and other services offered, go to [NextStepMaths.com](https://www.NextStepMaths.com)