

STEP II, 2007, Q7 MS

- Q7** I like this question, although I accept that lots of candidates were probably put off by a question that looks like something they've never seen before. However, it is often the case that questions of the "new and weird-looking kind" can actually turn out to be relatively easy IF you're prepared to be a bit adventurous.

The opening bit introduces you to a (possibly) new idea, and then gets you to practise this idea in a couple of cases in order that you get the hang of it. Then, in part (i), you actually get to use one of these ideas, and you're pretty much told exactly what to do, and which of the two initial functions to use to get the given result.

Next, in (ii), you're thrown in the deep-end rather more and left to decide what to do for yourself. Here, however, there is reference made to a mysterious "suitable function" to be used. Now, if you believe that the setter is out to trap you, trick you, and grind you into the ground then you probably think you're all on your own at this stage and have to find your own function. But you're wrong! The setters are actually trying to give you every opportunity to do some good mathematics, and every effort is made to point you in the right direction if it is felt at all suitable to do so. In this case, you were initially asked to show that the \sin and \ln functions had the property being referred to. Then you used the \sin function in (i). Perhaps, just *perhaps*, you are meant to be using the other one in (ii). If you can use the \ln function to establish this next result (called the *Arithmetic Mean – Geometric Mean Inequality*), then parts (a) and (b) at the end simply use it twice; once with very little thought required, and one with a little more thought needed. Be brave! Give it a go.

Answers: (ii) – 2.



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