

In fact at this stage of the course i.e. in A2  
the domain of  $\log$  is simply  $\mathbb{C} - \{0\}$  ①

Only later is this refined to  $\mathbb{C} - \{x \in \mathbb{R} : x \leq 0\}$  ②

The reason being that on domain ①  $\log$  is not continuous  
whereas on ②  $\log$  is continuous and differentiable.  
So the answers expected based on ①  
were

domain of  $g$   $\mathbb{C} - \{-3i\}$

domain of  $h$   $\mathbb{C} - \{-3i\}$