

|  |           |   |                              |
|--|-----------|---|------------------------------|
| <b>11</b>  | <b>1f</b> | What is the range of the function $f(x) = \ln(x^2 + e)$ ? | <b>1</b>                     |
| As $\ln(x^2 + e) \geq \ln e$<br>But $\ln e = 1$ , then $\ln(x^2 + e) \geq 1$<br>Range is $f(x) \geq 1$ |           |   | State Mean:<br><b>0.34/1</b> |

\* These solutions have been provided by [projectmaths](http://projectmaths.com.au) and are not supplied or endorsed by the Board of Studies

### Board of Studies: Notes from the Marking Centre

Approximately half of the candidates gave the correct response of  $y \geq 1$ . Successful responses recognised some feature of the function and investigated appropriate domain values, which led to establishing the range. For example, many noted that it was an even function, or some found a minimum value. However, in some poor responses candidates simply identified a log function and mistakenly wrote the natural domain as a range, or incorrectly assumed that if  $x > 0$  then  $y > 0$ .

Source: [http://www.boardofstudies.nsw.edu.au/hsc\\_exams/](http://www.boardofstudies.nsw.edu.au/hsc_exams/)