

<b>11</b>	<b>1d</b>	Using the substitution $u = \sqrt{x}$ , evaluate $\int_1^4 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$ .	<b>3</b>
$u = \sqrt{x} = x^{\frac{1}{2}}$ $\frac{du}{dx} = \frac{1}{2} x^{-\frac{1}{2}}$ $\frac{du}{dx} = \frac{1}{2\sqrt{x}}$ $dx = 2\sqrt{x} du$ $\int_1^4 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx = \int_{u=1}^{u=2} \frac{e^u}{\sqrt{x}} 2\sqrt{x} du$ $= 2 \int_{u=1}^{u=2} e^u du$ $= 2 \left[ e^u \right]_1^2$ $= 2(e^2 - e)$			When $x = 4$ , $u = 2$ . When $x = 1$ , $u = 1$ .
			State Mean: <b>2.41/3</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

Most candidates correctly found the derivative for the given substitution and/or changed the limits.

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