11	4d	(i) Differentiate $y = \sqrt{9-x^2}$ with respect to x.	2
		(ii) Hence, or otherwise, find $\int \frac{6x}{\sqrt{9-x^2}}\,dx$.	2

(i) $y = \sqrt{9-x^2}$

$= (9-x^2)^{\frac{1}{2}}$

Using the function of a function rule:

$\frac{dy}{dx} = \frac{1}{2}(9-x^2)^{-\frac{1}{2}}.(-2x)$

$= \frac{-x}{\sqrt{9-x^2}}$

(ii) From (i),

$\int \frac{-x}{\sqrt{9-x^2}}\,dx = \sqrt{9-x^2} + c$

$\therefore \int \frac{6x}{\sqrt{9-x^2}}\,dx = -6\sqrt{9-x^2} + c$

State Mean:
1.48/2
0.86/2

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

(i) The most common error was to multiply by the incorrect derivative (usually $2x$ instead of $-2x$) when using the chain rule. In a small number of cases, one was added to the power when differentiating, instead of being subtracted and, in some, the fractional index was a problem.

(ii) In many responses, candidates did not connect parts (i) and (ii) and attempted to integrate incorrectly using the reverse of the chain rule. Responses in which candidates were able to isolate their integral using part (i) were usually successful.

Source: **http://www.boardofstudies.nsw.edu.au/hsc_exams/**