11	2b	The function $f(x) = \cos 2x - x$ has a zero near $x = \frac{1}{2}$. Use one application of Newton's method to obtain another approximation to this zero. Give your answer correct to two decimal places.	3

State Mean: **2.11/3**

Let $f(x) = \cos 2x - x$

$\therefore f(\frac{1}{2}) = \cos 2(\frac{1}{2}) - (\frac{1}{2})$

$= 0.0403 \ldots$

$f'(x) = -2\sin 2x - 1$

$\therefore f'(\frac{1}{2}) = -2\sin 2(\frac{1}{2}) - 1$

$= -2.6829 \ldots$

Newton's Method: $x_1 = x_0 - \dfrac{f(x_0)}{f'(x_0)}$

$= \dfrac{1}{2} - \dfrac{0.0403}{-2.6829}$

$= 0.515 \ldots$

$= 0.52$ (2 dec pl)

* 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

This proved to be the most challenging part in Question 2. In many responses, candidates did not apply the Table of Standard Integrals to differentiate correctly, nor quote the correct formula for Newton's Method, nor substitute into the formula and evaluate correctly nor remember to use radian mode.

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