GCE

MEI Structured Mathematics

OCR Advanced GCE Unit 4753/02 Methods for Advanced Mathematics
Coursework Assessment Form

TASK: Candidates will investigate the solution of equations using the following three methods.

(i)   Systematic search for change of sign using one of the three methods: decimal search, bisection or linear interpolation.

(ii) Fixed point iteration using the Newton-Raphson method.

(iii) Fixed point iteration after rearranging the equation f (x) = 0 into the form x = g (x).

Coursework Title		Date	

Candidate Name		Candidate Number	

Centre Name		Centre Number	

Domain	Mark	Description	Comment	
Change of sign method (3)	1 1 1	The method is applied successfully to find one root of an equation. Error bounds are stated and the method is illustrated graphically. An example is given of an equation where one of the roots cannot be found by the chosen method. There is an illustrated explanation of why this is the case.		
Newton-Raphson method (5)	1 1 1 1 1	The method is applied successfully to find one root of a second equation. All the roots of the equation are found The method is illustrated graphically for one root. Error bounds are established for one of the roots. An example is given of an equation where this method fails to find a particular root despite taking a starting value close to it. There is an illustrated explanation why this has happened.		
Rearranging f(x)=0 in the form x=g(x) (4)	1 1 1 1	A rearrangement is applied successfully to find a root of a third equation. Convergence of this rearrangement to the root is demonstrated graphically and the magnitude of $g'(x)$ is discussed. A rearrangement of the same equation is applied in a situation where the iteration fails to converge to the required root. This failure is demonstrated graphically and the magnitude of $g'(x)$ is discussed.		
Comparison of methods (3)	1 1 1	One of the equations used above is selected and the other two methods are applied successfully to find the same root. There is a sensible comparison of the relative merits of the three methods in terms of speed of convergence. There is a sensible comparison of the relative merits of the three methods in terms of ease of use with available hardware and software.		
Written Communication (1)	1	Correct notation and terminology are used		
Oral Communication (2)	2	Presentation / Interview / Discussion — Please tick at least one box and give a brief report.		

Half marks may be awarded but the overall total must be an integer

Please report overleaf on any help that the candidate has received beyond the guidelines

TOTAL/18

Coursework must be available for moderation by OCR

INSTRUCTIONS FOR COMPLETION OF THIS FORM

1   One form should be used for each candidate.

2   Please ensure that the relevant information is provided in the spaces at the top of the form.

3   Enter comments and mark awarded for each domain in the relevant boxes. Half marks are permissible, but the overall total out of 18 (see point 4) must be an integer.

4   Add up the marks awarded for all the domains to give an overall total out of 18. Enter this total in the relevant box.