Commentary on candidate evidence

The candidate evidence has achieved the following marks for each question of this question paper.

Question 1

Candidate 1

- Mark 1, 2 and 3 awarded – the candidate has never used the mid-point calculated, and it is not relevant to the solution
- Marks 4 and 5 awarded – the candidate has answered in radians

Candidate 2

- Marks 1, 2 and 3 awarded
- Mark 4 awarded
- Mark 5 not awarded – note that the appearance of $\tan\frac{1}{2} = 26.2$ does not gain mark 5 either, see Candidate D in the Marking instructions

Candidate 3

- Marks 1, 2 and 3 awarded
- Mark 4 not awarded
- Mark 5 awarded on follow-through

Candidate 4

- Mark 4 awarded
- Mark 5 not awarded

Question 2

Candidate 5

- Marks 1, 2, 3 and 4 awarded

Candidate 6

- Marks 1, 2 and 3 awarded
- Mark 4 not awarded – numerical errors when rearranging the equation were common

Candidate 7

- Mark 1 not awarded
- Mark 2 awarded
- Mark 3 not awarded – see Note 4 and Candidate A
- Mark 4 not awarded

Candidate 8

- Mark 1 not awarded
- Mark 2 awarded – see Note 3
- Mark 3 not awarded – see Note 4 and Candidate A
- Mark 4 not awarded – see Note 5

Candidate 9

- Mark 1 not awarded
- Mark 2 awarded – see Note 3
- Marks 3 and 4 not awarded

Question 3

Candidate 10

- Marks 1 and 2 not awarded

Candidate 11

- Mark 1 awarded
- Marks 2 not awarded – see Candidate D

Question 4

Candidate 12

- 1/2 awarded – this is a graph of $-2f(x)$

Candidate 13

- 0/2 awarded – no consideration has been given to the orientation of the graph

Candidate 14

- 2/2 awarded – a tolerance was applied to the key points on the graph

Question 5

Candidate 15

- Mark 1 awarded
- Mark 2 not awarded
- Mark 3 awarded on follow-through – see Candidate A

Candidate 16

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 not awarded – errors processing integers were common

Candidate 17

- Mark 1 awarded
- Mark 2 not awarded – the candidate has differentiated over two lines (see Candidate D)
- Mark 3 not awarded

Question 6

Candidate 18

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 not awarded – the candidate has contradictory expressions for y (see Candidate A)

Candidate 19

- Mark 1 awarded
- Mark 2 not awarded – many candidates struggled to work with $\frac{2}{x}$
- Mark 3 awarded on follow-through

Candidate 20

- Mark 1 awarded
- Mark 2 not awarded – the candidate has not dealt with $\frac{1}{x}$
- Mark 3 awarded on follow-through

Candidate 21

- Mark 1 not awarded
- Mark 2 not awarded – See Candidate G
- Mark 3 awarded on follow-through

Question 7

Candidate 22

- Mark 1 not awarded
- Mark 2 awarded on follow-through
- Mark 3 awarded on follow-through
- Mark 4 awarded on follow-through
- Mark 5 not awarded

Candidate 23

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 not awarded
- Mark 4 awarded on follow-through
- Mark 5 awarded on follow-through

Question 8

Candidate 24

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded – the $\frac{-2^4}{4}$ is not dealt with as $\frac{(-2)^4}{4}$
- Mark 5 not awarded – there is a further error in processing the stated substitution

Candidate 25

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 awarded – in this case the bad form has been corrected and the $\frac{-2^4}{4}$ has been dealt with as if it were $\frac{(-2)^4}{4}$
- Mark 5 not awarded – there is a further error in processing the substitution

Candidate 26

- Mark 1 not awarded
- Mark 2 awarded
- Mark 3 not awarded
- Mark 4 awarded on follow-though

- Mark 5 not awarded – see Candidate B for a similar response

Candidate 27

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 not awarded
- Mark 4 awarded on follow-through
- Mark 5 awarded on follow-through

Question 9

Candidate 28

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 not awarded
- Mark 4 awarded on follow-through

Candidate 29

- Mark 1 not awarded
- Mark 2 not awarded
- Mark 3 awarded
- Mark 4 awarded on follow-through
- Mark 5 awarded
- Marks 6 and 7 not awarded – attempting to solve $14\cos x - 6\sin x = 0$ was common

Candidate 30

- Mark 1 awarded
- Mark 2 not awarded
- Mark 3 awarded
- Mark 4 not awarded – the expression is not in the required form
- Mark 5 not awarded
- Mark 6 awarded
- Mark 7 not awarded – see Candidate G for a similar response

Question 10

Candidate 31

Using Method 1

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded – justification is required

Candidate 32

Using Method 1

- Marks 1, 2, 3 and 4 awarded

Candidate 33

Using Method 1 – mark using both methods and award the higher mark

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded – incorrect and justification is required

Candidate 34

Using Method 2

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded – justification is required

Candidate 35

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded

Question 11

Candidate 36

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded – the incorrect simplification is subsequent to the correct answer
- Mark 4 awarded
- Mark 5 awarded
- Mark 6 not awarded – it was common to see expressions of the form $\sqrt{a}+\sqrt{b}$ being "simplified" to $\sqrt{a+b}$

Candidate 37

- Marks 1, 2 and 3 awarded
- Mark 4 awarded
- Mark 5 awarded
- Mark 6 not awarded – a decimal comparison is required Candidate 38
- Marks 1, 2 and 3 awarded
- Mark 4 awarded

- Mark 5 not awarded
- Mark 6 not awarded – it was common to see expressions of the form $\sqrt{a}+\sqrt{b}$ being "simplified" to $\sqrt{a+b}$

Question 12

Candidate 39

- Mark 1 awarded
- Marks 2, 3 and 4 not awarded – see Note 1

Candidate 40

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded

Candidate 41

- Mark 1 awarded
- Mark 2 not awarded – the integration has been completed over two lines of working (see Candidate C)
- Mark 3 awarded
- Mark 4 not awarded

Candidate 42

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded – see general marking principle J

Question 13

Candidate 43

- Mark 1 not awarded – it was common to see additional, unnecessary lines of working
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded – the candidate has found $\log_{10} 0.06$ rather than $\ln 0.06$

Candidate 44

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded – see Note 6

- Mark 4 not awarded – see Note 8

Candidate 45

- Mark 1 awarded
- Mark 2 not awarded
- Marks 3 and 4 awarded on follow-through – see Note 1

Candidate 46

- Mark 2 not awarded
- Marks 3 and 4 awarded on follow-through

Question 14

Candidate 47

- Mark 1 not awarded
- Mark 2 awarded – see Note 2
- Mark 3 not awarded
- Marks 4, 5 and 6 awarded
- Mark 7 not awarded

Candidate 48

- Mark 1 awarded
- Marks 2 and 3 not awarded – working in additional space
- Marks 4, 5 and 6 – the same marks are available in both attempts
- Mark 7 not awarded – error in the nature table

Candidate 49

- Mark 4 not awarded
- Mark 5 awarded on follow-through
- Mark 6 awarded on follow-through
- Mark 7 not awarded – $V'(4.5) = -108.675$

Question 15

Candidate 50

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 awarded
- Mark 4 not awarded – it was common to see candidates setting $y = 0$

Candidate 51

- Mark 1 not awarded
- Mark 2 awarded on follow-through
- Mark 3 awarded on follow-through
- Mark 4 not awarded – error in numerical processing

Candidate 52

- Mark 1 awarded
- Mark 2 awarded
- Mark 3 not awarded
- Mark 4 awarded on follow-through