Question	Scheme	Marks	AOs
7(a)	Both 3.067	B1	1.1b
		(1)	
(b)	$h = 1.2$	B1	1.1b
	$\frac{\cdots}{2}\left[0+0+2\left(3.067+3.901+3.901+3.067\right)\right]\left(=16.723\right)$	M1	1.1b
	$8\times 5-"16.723"$	M1	3.1a
	$=23.277$	A1	1.1b
		(4)	
(c)	Increase the number of strips/trapezia used.	B1	2.4
		(1)	
(d)	States 'overestimate' and refers to the fact that part (b) is an underestimate.	M1	2.4
	Qualifies that the trapezium rule underestimates the area under the curve *C* since the trapezia lie below the curve.	A1	2.2a
		(2)	
			(8 marks)

Notes:

(a)

B1: Both 3.067

(b)

B1: $h = 1.2$ seen or used

M1: For the correct structure of the trapezium rule. Look for any of

- $\frac{\cdots}{2}\left[0+0+2\left("3.067"+3.901+3.901+"3.067"\right)\right]$
- $\frac{\cdots}{2}\left[2\left("3.067"+3.901+3.901+"3.067"\right)\right]$
- $\frac{\cdots}{2}\left[4\left("3.067"+3.901\right)\right]$

M1: $8\times 5-"16.723"$

(Note that the accuracy from numerical integration on a calculator is 18.30623432)

A1: 23.277

(c)

B1: Either of

- increase the number of strips/trapezia
- decrease the width of the strips/trapezia

(d)

M1: See scheme

A1: See scheme