Question Number	Scheme	Marks
1	$h = 0.2$	B1
	$\frac{1}{2}\times"0.2"\times\left[9.2+8.6+2(8.4556+3.8512+5.0342+7.8297)\right]$	M1
	6.814	A1
		(3 marks)

B1 $h = 0.2$ o.e. (including $\frac{5-4}{5}$) seen or implied by sight of e.g. $\frac{0.2}{2}$ or $\frac{1}{10}$ in front of the bracket.
May also be implied by a correct answer if no incorrect working seen. $h = -0.2$ is B0

M1 Correct application of the trapezium rule with their *h* (which may be 1 or *h*).
Look for a correct inner bracket structure $9.2+8.6+2(8.4556+3.8512+5.0342+7.8297)$ condoning slips copying values from the table or the omission of the final brackets on the rhs

e.g. $\frac{1}{2}\times"0.2"(9.2+8.6+2(8.4556+3.8512+5.0342+7.8297$ is M1

but $\frac{1}{2}\times"0.2"\times 9.2+8.6+2(8.4556+3.8512+5.0342+7.8297)$ is M0 unless the brackets are recovered or implied by the correct answer (you may need to check this)

Also allow for a correct method adding individual trapezia using their *h* condoning copying errors but the brackets must be correct (or recovered or implied by later work)

e.g. $\frac{1}{2}\times"0.2"(9.2+8.4556)+\frac{1}{2}\times"0.2"(8.4556+3.8512)+\frac{1}{2}\times"0.2"(3.8512+5.0342)+$
$\frac{1}{2}\times"0.2"(5.0342+7.8297)+\frac{1}{2}\times"0.2"(7.8297+8.6)$

A1 awrt 6.814 isw once a correct answer is seen. Correct answer with no working scores B1M1A1 but if there is evidence of using $h = -0.2$ then maximum awarded is B0M1A0
The A mark cannot be awarded without both B1M1 being awarded on this question.

Question Number	Scheme	Marks
2a	$\left(\text{f}\left(\frac{3}{2}\right)=\right)\ 4\left(\frac{3}{2}\right)^3-8\left(\frac{3}{2}\right)^2+5\left(\frac{3}{2}\right)+a=0\Rightarrow a=...$	M1
	$\Rightarrow \frac{27}{2}-18+\frac{15}{2}+a=0\Rightarrow a=-3$ *	A1*
		(2)
b	Example where $2x-3$ is a linear factor: $2x-3\overline{)4x^3-8x^2+5x-3}$ $\quad 2x^2-x+1$ $4x^3-6x^2$ $-2x^2+5x$ $-2x^2+3x$ $+2x-3$ $+2x-3$ 0	M1A1
	$(-1)^2-4\times2\times1=-7<0\Rightarrow$ no real roots so $x=\frac{3}{2}$ is the only one real root *	dM1A1*
		(4)
		(6 marks)

(a)

M1 Substitutes $x=\frac{3}{2}$ into the expression, sets equal to 0 (may be implied for this mark) and rearranges to find *a*. Condone invisible brackets for this mark only and condone arithmetical slips in their working.

Substituting $x=-\frac{3}{2}$ is M0 and attempts via long division score M0.

A1* $a=-3$ achieved with no errors seen including the omission of brackets.

There must be sight of $x=\frac{3}{2}$ which may be embedded in the expression or $\text{f}\left(\frac{3}{2}\right)$ followed by at least one intermediate stage of working/manipulation (it may just be the left hand side of the equation), before proceeding to the given answer. The "$=0$" must be seen somewhere in their working before the given answer.

e.g.

$4\left(\frac{3}{2}\right)^3-8\left(\frac{3}{2}\right)^2+5\left(\frac{3}{2}\right)+a=0\Rightarrow a=-3$ is M1A0

$\text{f}\left(\frac{3}{2}\right)=\frac{27}{2}-18+\frac{15}{2}+a=0\Rightarrow a=-3$ is M1A1

Note the trivial case $\text{f}\left(\frac{3}{2}\right)=3+a=0\Rightarrow a=-3$ is M1A0 (not enough shown)

(b) Work done in (a) must be made use of in (b) to gain credit.

M1 Attempts to find a quadratic factor of $4x^3-8x^2+5x-3$ using $2x-3$ as a factor

- score for $2x^2\pm x\pm...$ if algebraic division is used or
- score for $2x^2\pm...x\pm1$ if equating coefficients/inspection used.