Question	Scheme	Marks	AOs
1(a)(i)	$y = 4x^3 - 7x^2 + 5x - 10 \Rightarrow \left(\frac{dy}{dx} =\right) 12x^2 - 14x + 5$	M1 A1	1.1b 1.1b
(ii)	$\left(\frac{d^2y}{dx^2} =\right) 24x - 14$	A1ft	1.1b
		(3)	
(b)	$24x - 14 = 0 \Rightarrow x = ...$	M1	1.1b
	$x = \frac{7}{12}$ oe e.g. $x = \frac{14}{24}$	A1	1.1b
		(2)	
			(5 marks)

Notes

(a)(i) If "+ *c*" is included with either derivative penalise it only once on the first occurrence.

M1: Award for $x^3 \to x^2$ or $x^2 \to x$ or $5x \to 5$ or $-10 \to 0$
Indices may be unprocessed e.g. $x^3 \to x^{3-1}$ or $x^2 \to x^{2-1}$ or $5x \to 5x^0$

A1: Correct <u>simplified</u> expression with indices processed $12x^2 - 14x + 5$.
Do **not** allow x^1 for x or $5x^0$ for 5.
Apply isw if necessary once a correct answer is seen.
The "$\frac{dy}{dx} =$" is **not** required.

(ii)

A1ft: Correct simplified second derivative $24x - 14$ or follow through their first derivative.
Must be <u>simplified</u> so do **not** allow e.g. x^1 for x or x^0 for 1 as above.
Apply isw if necessary once a correct answer is seen.
The "$\frac{d^2y}{dx^2} =$" is **not** required.

(b)

M1: Sets their **second derivative** of the form $ax + b,\ a, b \neq 0$ equal to 0 and proceeds to a value for x. Condone slips in rearranging as long as a value for x is obtained.
This may be implied by their value of x or may be implied by their working e.g.
$\left(\frac{d^2y}{dx^2} =\right) 24x - 14 \to 24x = 14 \Rightarrow x = ...$
Condone one slip in copying their second derivative.
Also condone if they "cancel" e.g. $\left(\frac{d^2y}{dx^2} =\right) 24x - 14 \to 12x - 7 = 0 \Rightarrow x = ...$

A1: Correct value from correct work and a correct second derivative but allow recovery if they "cancel" their second derivative to obtain e.g. $12x - 7$.
Allow exact equivalents e.g. $\frac{14}{24}$ but not rounded decimals e.g. 0.583
Allow recurring decimal if clearly indicated e.g. $0.58\dot{3}$
Correct answer only from a correct second derivative (or correctly cancelled second derivative) scores both marks.
Isw after a correct answer is seen.