Question Number	Scheme	Marks
6.(a)	$f'(x) = 5x^{\frac{3}{2}} - 40$	M1A1
	Attempts $5x^{\frac{"3"}{2}} - 40 = 0 \Rightarrow x^{\frac{"3"}{2}} = ..$	M1
	$x = 4$	A1 cao (4)
(b)	$f''(x) = \frac{15}{2}x^{\frac{1}{2}} = 5$	M1
	$\Rightarrow x^{\frac{1}{2}} = .. \Rightarrow x = ..^2$ $\quad x = \frac{4}{9}$	M1 A1 (3)
		(7 marks)

(a)

M1 For reducing the power by one on either x term ($x^{\frac{5}{2}} \rightarrow x^{\frac{3}{2}}$ or $-40x \rightarrow -40$)

A1 Correct (but may be unsimplified) $\left[f'(x)\right] = 5x^{\frac{3}{2}} - 40$

M1 Attempts to solve their $f'(x) = 0 \Rightarrow x^{\frac{"3"}{2}} = ...$ by making their $x^{\frac{"3"}{2}}$ the subject. Their $f''(x)$ must be a changed function. This can be implied by their final answer. If their $f'(x) = 0$ is of the form $f'(x) = Ax^B + Cx^D$ then this mark can be awarded for taking a factor out eg. $x^B(A + Cx^{D-B})$ and doing the same as above on the terms in their bracket.

A1 $x = 4$ cao (do not accept ± 4)

(b)

M1 For reducing the power by one on one of their terms in $f'(x)$ and setting their $f''(x) = 5$

M1 For a correct method leading to $x = \ldots$ from an equation of the form $Ax^{\frac{1}{2}} = 5$.
Eg for $\frac{15}{2}x^{\frac{1}{2}} = 5$ either makes $x^{\frac{1}{2}}$ the subject and squares or squares both sides and makes x the subject. This can be implied by their final answer. Do not allow slips on the power.

A1 $x = \frac{4}{9}$ or exact equivalent

The question states that solutions based entirely on graphical or numerical methods are not acceptable. Therefore if no differentiation is shown then this will score no marks.

Question Number	Scheme	Marks
7.(a)	Attempts $\frac{\sin\angle ACB}{6.5}=\frac{\sin 35}{4.7}$	M1
	$\angle ACB=$ awrt(52 or 53)° or awrt(127or128)°	A1
	$\angle ACB=127.5°$	A1
(b)	Eg $\frac{(AC)}{\sin"17.5°"}=\frac{6.5}{\sin"127.5°"}$ or $=\frac{4.7}{\sin 35°}$	M1 **(3)**
	$\left[\frac{(CD)}{\sin"75°"}=\frac{4.7}{\sin"127.5°"}\Rightarrow(CD)=...\Rightarrow(AC)+(CD)\right]$=awrt 8.2	A1
	Total length of wood $=8.1+6.5+4.7+4.7=$ awrt24.1	A1
		(3) **(6 marks)**
Alt1(a)	$\cos 35=\frac{AC^2+6.5^2-4.7^2}{2\times 6.5\times AC}\Rightarrow AC^2-13\cos(35)AC+20.16=0\Rightarrow AC=...$	
	$\cos\angle ACB=\frac{"AC"^2+4.7^2-6.5^2}{2\times"AC"\times 4.7}$ oe	M1

(a)

M1 Uses the sine rule with the angles and sides in the correct positions.

Alternatively they may use the cosine rule on ACB and then solve the subsequent quadratic to find AC and then use the cosine rule again

A1 $\angle ACB=$ awrt(52 or 53)° or awrt(127or128)°

A1 $\angle ACB=127.5°$ only