Question	Scheme	Marks	AOs
2	Let $u=\sqrt{x}$ $\quad 6x+7\sqrt{x}-20=0 \Rightarrow 6u^2+7u-20=0$ $\Rightarrow (3u-4)(2u+5)\{=0\}$	M1A1	1.1b 1.1b
	Attempts $\sqrt{x}=\text{"}\frac{4}{3}\text{","}-\frac{5}{2}\text{"} \Rightarrow x=\ldots$	M1	1.1b
	$x=\frac{16}{9}$ only	A1 cso	2.3
		(4)	
		(4 marks)	
Alt 1	$6x+7\sqrt{x}-20=0 \Rightarrow 7\sqrt{x}=20-6x \Rightarrow 49x=(20-6x)^2$ $\Rightarrow 49x=400-240x+36x^2$	M1	1.1b
	$36x^2-289x+400\{=0\}$	A1	1.1b
	$(9x-16)(4x-25)=0$	M1	1.1b
	$x=\frac{16}{9}$ only	A1 cso	2.3
		(4)	
Alt 2	$6x+7\sqrt{x}-20=0 \Rightarrow (3\sqrt{x}-4)(2\sqrt{x}+5)=0$	M1 A1	1.1b 1.1b
	Attempts $\sqrt{x}=\text{"}\frac{4}{3}\text{","}-\frac{5}{2}\text{"} \Rightarrow x=\ldots$	M1	1.1b
	$x=\frac{16}{9}$ only	A1 cso	2.3
		(4)	

Notes:

M1: Attempts a valid method that enables the problem to be solved. See General Principles for Pure Mathematics Marking at the front of the mark scheme for guidance. Score for either letting $u=\sqrt{x}$ and attempting to factorise to $(au\pm c)(bu\pm d)$ with $ab=6, cd=20$

or making $7\sqrt{x}$ the subject and attempting to square both sides.

or attempting to factorise to $(a\sqrt{x}\pm c)(b\sqrt{x}\pm d)$ with $ab=6, cd=20$

or by quadratic formula or completing the square following usual rules.

A1: $(3u-4)(2u+5)\{=0\}$ **or** $36x^2-289x+400\{=0\}$ **or** $(3\sqrt{x}-4)(2\sqrt{x}+5)\{=0\}$

If they use the formula, it must be correct e.g., $u\,\{\text{or}\sqrt{x}\}=\frac{-7\pm\sqrt{7^2-4(6)(-20)}}{12}$ followed by $u\,\{\text{or}\sqrt{x}\}=\frac{4}{3}$ or equivalent e.g., $\frac{16}{12}$. Ignore if they have $u\,\{\text{or}\sqrt{x}\}=-\frac{5}{2}$ or not.

If they complete the square, they must have $\left(u+\frac{7}{12}\right)^2=\frac{529}{144}$ followed by $u\left\{\text{or}\sqrt{x}\right\}=\frac{4}{3}$ or equivalent e.g., $\frac{16}{12}$. Ignore if they have $u\left\{\text{or}\sqrt{x}\right\}=-\frac{5}{2}$ or not.

M1: Correct method from $p\sqrt{x}\pm q=0$ leading to $x=\ldots$ by squaring

In Alt 1, it is for solving their quadratic using the General Principles for Pure Mathematics Marking. There must be a method shown, i.e., the solutions should not come straight from a calculator. If attempting to factorise, it must be to $(ax\pm c)(bx\pm d)$ with $ab=36, cd=400$

In Alt 2, it is for squaring their value(s) for u to get $x=\ldots$

A1: **cso** $x=\frac{16}{9}$ only. $x=\frac{25}{4}$ must be discarded. Note 0011 is not possible.

Allow "incorrect" $x=-\frac{16}{9}$ or $x=-\frac{25}{4}$ to be seen as long as they are discarded.

Ignore any reason they give for rejecting solutions.

Note that a method to solve their quadratic must be seen – solutions must not come directly from a calculator. Simply stating the quadratic formula (without substitution) is insufficient.