Question	Scheme	Marks	AOs
12(a)	Sets $3x-2\sqrt{x}=8x-16$	B1	1.1a
	$2\sqrt{x}=16-5x$ $4x=(16-5x)^2 \Rightarrow x=..$ $5x+2\sqrt{x}-16=0$ $\Rightarrow (5\sqrt{x}\pm 8)(\sqrt{x}\pm 2)=0$	M1	3.1a
	$25x^2-164x+256=0$ $(5\sqrt{x}-8)(\sqrt{x}+2)=0$	A1	1.1b
	$(25x-64)(x-4)=0 \Rightarrow x=..$ $\sqrt{x}=\frac{8}{5},(-2) \Rightarrow x=..$	M1	1.1b
	$x=\frac{64}{25}$ only	A1	2.3
		(5)	
(b)	Attempts to solve $3x-2\sqrt{x}=0$	M1	2.1
	Correct solution $x=\frac{4}{9}$	A1	1.1b
	$y \leqslant 3x-2\sqrt{x}$, $y>8x-16$ $x \geqslant \frac{4}{9}$	B1ft	1.1b
		(3)	
		(8 marks)	

Notes:

(a)

B1: Sets the equations equal to each other and achieves a correct equation

M1: Awarded for the key step in solving the problem. This can be awarded via two routes. Both routes must lead to a value for *x*.

- Making the $\sqrt{x}$ term the subject and squaring both sides (not each term)
- Recognising that this is a quadratic in $\sqrt{x}$ and attempting to factorise $\Rightarrow (5\sqrt{x}\pm 8)(\sqrt{x}\pm 2)=0$

A1: A correct intermediate line $25x^2-164x+256=0$ or $(5\sqrt{x}-8)(\sqrt{x}+2)=0$

M1: A correct method to find at least one value for *x*. Way One it is for factorising (usual rules), Way Two it is squaring at least one result of their $\sqrt{x}$

A1: Realises that $x=\frac{64}{25}$ is the only solution $x=\frac{64}{25},4$ is A0

(b) **M1:** Attempts to solve $3x-2\sqrt{x}=0$ For example

Allow $3x=2\sqrt{x} \Rightarrow 9x^2=4x \Rightarrow x=...$

Allow $3x=2\sqrt{x} \Rightarrow x^{\frac{1}{2}}=\frac{2}{3} \Rightarrow x=...$

A1: Correct solution to $3x-2\sqrt{x}=0 \Rightarrow x=\frac{4}{9}$

B1: For a **consistent** solution defining *R* using either convention

Either $y \leqslant 3x-2\sqrt{x}$, $y>8x-16$ $x \geqslant \frac{4}{9}$ Or $y<3x-2\sqrt{x}$, $y \geqslant 8x-16$ $x>\frac{4}{9}$